PAPER TRADE JOURNAL

APRIL 11, 1960

Cost Advantages Shown for Two Recent Pulping Developments

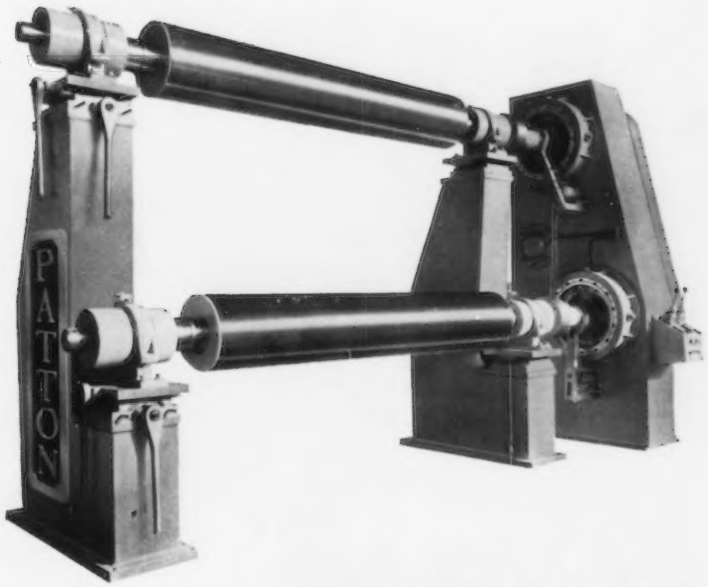
What Fine Paper Manufacturers Are Worrying About

Prime Concern of Supercalender Maintenance is Filled Rolls

Adequate Storage Area Vital For Efficient Finishing Operation

UPRIGHT REELS

NEW DESIGN with a. c. drive
water cooled unwind brake
and air cooled slip clutch



by PATTON

THE PATTON MANUFACTURING COMPANY, INC. • SPRINGFIELD, OHIO
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1806 W. PLEASANT ST.

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DOW

Now, from The Dobeckmun Division—
unconverted TRYCITE—for marketers and
manufacturers who do their own packaging!

Available now through Dobeckmun, Trycite, a polystyrene film, product of Dow packaging films research, is now yours to use in unconverted form . . . together with whatever technical assistance you may need . . . plus expert packaging counsel from the acknowledged leader in the field. Keenly priced to be competitive, Trycite possesses unexcelled sparkling transparency. Trycite will not become brittle with age, neither will it crack or deteriorate. Trycite does not absorb moisture, thereby eliminating distortion. Trycite's economy, excellent ageing, and dimensional stability make it especially suitable for the overwrapping of games, toys, novelties, and paper products of all kinds. If you do your own packaging, investigate Trycite—call the source that delivers the service as well as the goods.

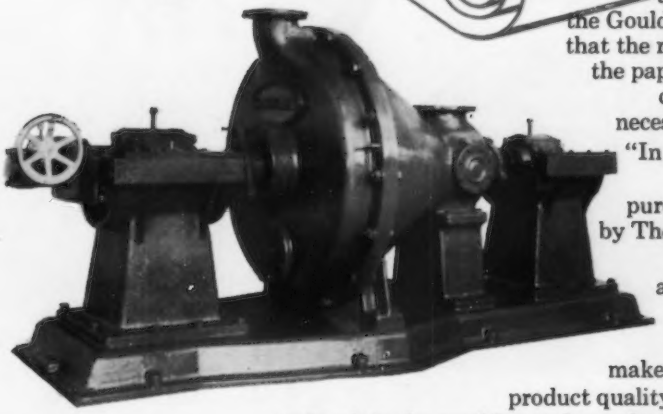
THE DOBECKMUN COMPANY DOW

A Division of The Dow Chemical Company, Cleveland 1, Ohio • Berkeley 10, California • Offices in most principal cities.

*T. M. The Dow Chemical Company

"A better sheet at lower price"...

says David K. Cooper, Jr., Chief Engineer, Gould Paper Company, Lyons Falls, New York



"In our efforts to produce a better sheet at lower price than our competitors," the Gould Paper Company reports, "we found that the refining equipment for stock ahead of the paper machines did not permit the close control of the stock properties that is necessary to meet exacting specifications.

"In order to get the necessary control on No. 2 Machine, it was decided to purchase a Claflin refiner, manufactured by The Emerson Manufacturing Company.

"Results have been excellent, and a similar machine has been purchased for installation on No. 1 Machine.

"This equipment gives the paper makers the tools necessary to improve our product quality, and by making the sheet less likely to break in the machine, reduces the labor entailed in restoring the sheet."

Whether, like the Gould Paper Company, your mill is refining bleached and unbleached groundwood blended with other hardwoods, or other grades, chances are excellent that the Emerson Claflin can help you produce "a better sheet at lower cost," too.

Recognized as *the* most versatile of all refiners, the Emerson Claflin is matchless in preparing a wide range of furnishes — Fine Papers . . . Container and Liner Board . . . Bag, Wrap, Multi-wall, Gumming . . . Corrugating . . . Roofing . . . and Wall Board . . . Hot Stock, High Yield and others.

Only Emerson makes the Claflin. For more information, write The Emerson Manufacturing Co., Division of John W. Bolton & Sons, Inc., Lawrence, Massachusets.

Now . . . the NEW

EMERSON CLAFLIN 303

newly engineered for new operating efficiency

Among its features —

- Oil mist lubrication system
- Visual oil and pressure gauges
- Interchangeable shafts
- Micro-feed plug adjustment
- Withstands 100 psi throughout
- Split head for easy stuffing removal
- Fully enclosed bearings
- Centralized inspection and control points

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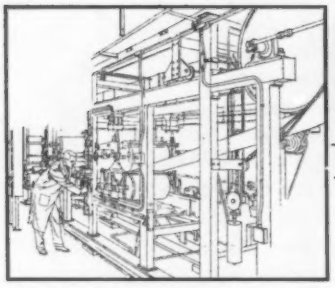
GENETICS + SYNTHETICS + ADVANCED THINKING

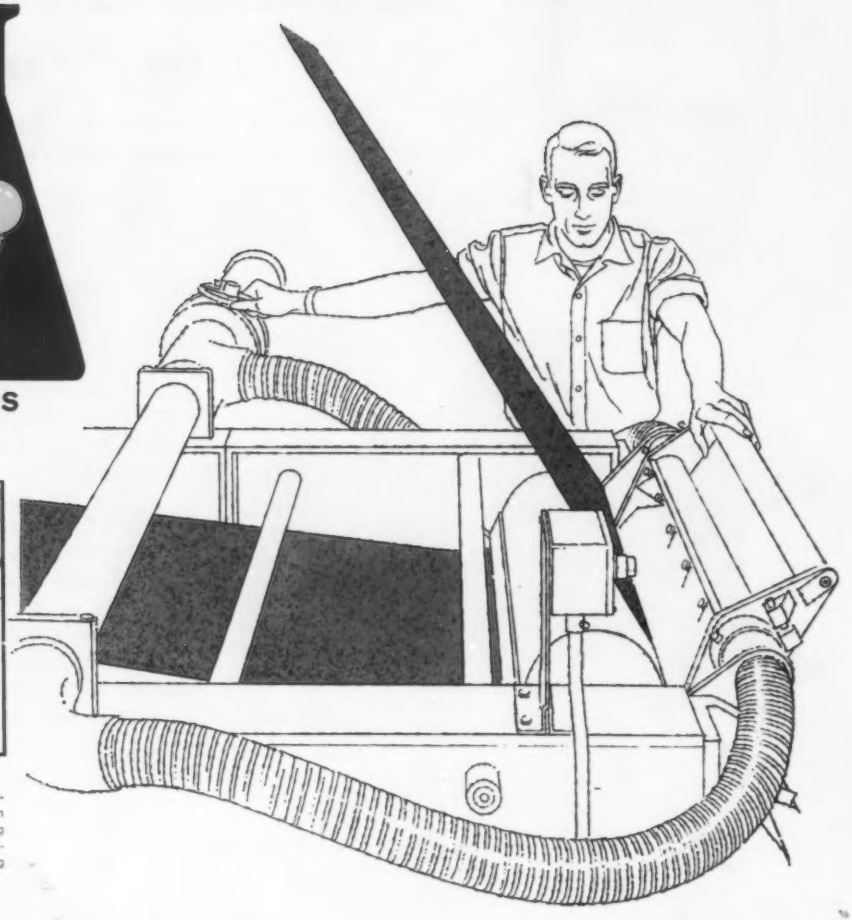
STARCHES

RESINS



Another NATIONAL first:

A 45-foot research laboratory paper coater. Approximating mill size roll diameters. 2,000 fpm speed. Capable of reproducing most mill coating methods in conjunction with a 5 high super calendar or 6 high machine stack. Air knife coating shown at right.



IMPROVES COATED BLEACHED BOARD

A great new advantage! Complete flexibility of formulation in creating new and unique starch and resin coatings for paper. The result of NATIONAL's "cross pollination" of unique starch derivatives with vinyl acetate polymers and copolymers in emulsion form.

Take pigment coated bleached board for example:

A "cross pollinated" starch-resin binder system improves printability and carton glueability. Gives excellent ink and wax holdout. Assures good printing press performance. Avoids machining problems. All at a considerable price advantage due to low cost resins and ease of formulation.

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Similar "cross pollinated" systems are improving coated publication papers, offset coatings, functional coatings and size press coatings. We'd welcome an opportunity to explain them in more detail. Just write or contact your nearest National office.

You'll find our coating binders and adhesives — everywhere!

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CORPORATION
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PAPER TRADE JOURNAL

PUBLISHED WEEKLY SINCE 1872

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REMEMBER THESE DATES

May 23-25. TAPPI Coating Conference, Edgewater Beach Hotel, Chicago, Ill.

June 14-16. TAPPI Bleaching Conference, Edgewater Beach Hotel, Chicago, Ill.

June 7-9. PIMA National Meeting, St. Francis Hotel, San Francisco, Calif.

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In the pulp and paper industry, Ebasco is uniquely prepared to serve in every phase of operations . . . from purchasing of raw materials, to planning and erecting automated plants, to installing modern accounting methods. Ebasco's unmatched experience in a wide scope of operations assures planning that adequately meets immediate needs and allows for easy, economical expansion to meet future growth.

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Faster Drying
SCAPA
*Synthetic Reinforced Cotton Dryer Felt

Type ※1164-S and ※1166-S

Running up to double life of competitive cotton felts—outrunning asbestos felts in many cases—bringing the advantage of faster drying found only in cotton felts.

Scapa staggered-butt clipper seam using synthetic tapered webbing is engineered to give the extra life required from these longer running Scapa felts.

Prompt, dependable shipments from our new mill at Waycross, Georgia, including all widths from the smallest felt through the widest felts in the country.

Can be furnished with our famous GREEN DACRON EDGE when desired (U.S. PATENT 2,612,190). These reinforced edges of pure, spun Dacron will outwear the felt, under the most severe conditions.

*U.S. Patent No. 2,882,933

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It pays to buy from a line of stock bearings—bearings that have been proved in thousands of installations similar to yours. You benefit by getting known dependability; and you get the important savings of high quality at production price.

PIN-POINT SELECTIVITY

Dodge has supplied mounted bearings to industry for over three-quarters of a century. Dodge bearings have always kept pace with improved production practices. Each new condition of service has been met by Dodge as it has arisen, with the result that the Dodge line contains mounted bearings to meet almost every service requirement with pin-point accuracy.

High load, high speed, excessive dust, moisture, corrosion, high or low temperatures, continuous operation—you name it!—such conditions and their combinations are met every day with Dodge bearings.

BROAD LINE—WIDELY DISTRIBUTED

In the great variety of mounted bearings developed by Dodge, you will most likely find the precise unit to fit your requirements ideally—without paying for features you do not need. And if your requirements call for several types of bearings, there is an advantage in having them of common design, such as Dodge offers.

The Dodge line is probably broader than any other line of mounted bearings in America. And of special importance to machinery manufacturers, it is the most widely distributed line. There is always a Dodge bearing of the right type and size near at hand.

You can check this with your local Dodge Distributor. Ask him—or write us for the Dodge Bearing Bulletin.

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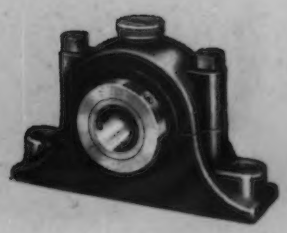
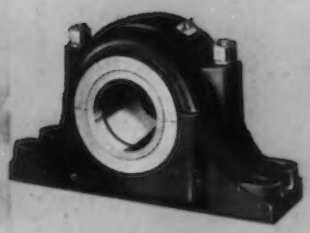
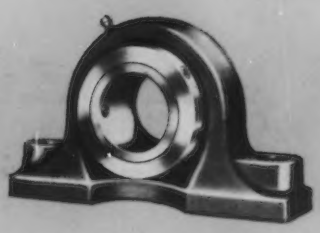


DODGE PILLOW BLOCKS WITH TIMKEN TAPERED ROLLER BEARINGS



DODGE SPHER-ALIGN PILLOW BLOCKS WITH SPHERICAL ROLLER BEARINGS



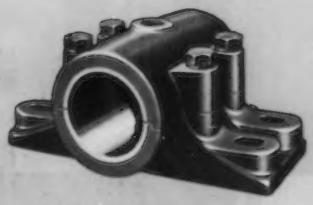
DODGE BALL BEARING PILLOW BLOCKS

DODGE SLEEVOIL PILLOW BLOCKS

DODGE BRONZOIL PILLOW BLOCKS

DODGE BRONZE BUSHED PILLOW BLOCKS

DODGE JOURNAL BEARINGS SOLID AND SPLIT



DODGE HEAVY RIGID PILLOW BLOCKS

FLANGE BEARINGS: HANGER BEARINGS: BEARING UNITS: TAKE-UPS

● **Dodge Pillow Blocks with Timken Tapered Roller Bearings.** America's quality pillow blocks. Assembled, lubricated, adjusted and sealed at the factory. 5 types for varying needs.

● **Dodge Spher-Align with Spherical Roller Bearings.** Rugged heavy duty, compact, inherently self-aligning. Exclusive Micro-Mount simplifies installation.

● **Dodge Ball Bearing Pillow Blocks.** Deep groove ball bearings with long inner races—high capacity. SL, SC and SCM models for light, normal and medium service respectively.

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● **Dodge Bronzoil Pillow Blocks.** Efficient, low cost pillow blocks with self-oiling, capillary bronze bushings. Self-aligning. Large oil reservoirs.

● **Dodge Bronze Bushed Pillow Blocks.** Quiet fan and blower pillow blocks with two bronze bushings of high lead content mounted in one cast iron housing.

● **Dodge Journal Bearings — Solid and Split.** True running, dependable. Babbitted bearings with precision machined bores and faces. Finished bases.

● **Dodge Heavy Rigid Pillow Blocks.** Rugged, carefully bored, babbitted pillow blocks for many applications requiring grease lubrication. Finished bases and ends.

● **Bearing Units.** A wide variety—spherical seat, cartridge, flange, hanger, screw conveyor hanger, take-up. Ball, Roller and Sleeve types.

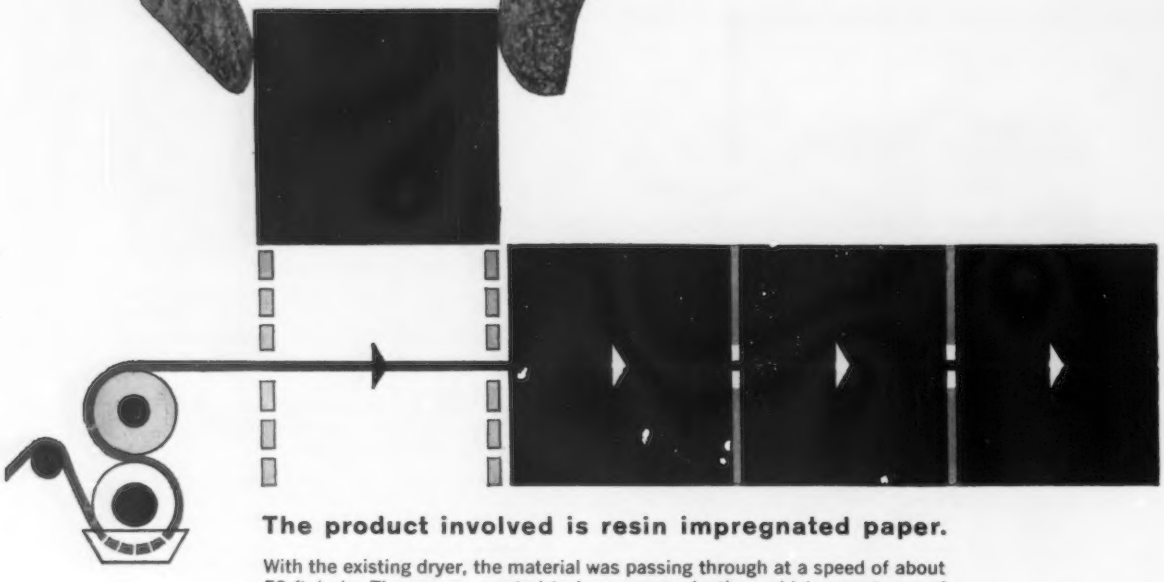
CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."

DODGE

of Mishawaka, Ind.

production increased 50%+

...by adding a section to the dryer.



The product involved is resin impregnated paper.

With the existing dryer, the material was passing through at a speed of about 50 ft./min. The owners wanted to increase production, which meant one of two things: a new line or increased output from the existing line, which, in turn, would call for higher speed. But the existing unit could not operate at a higher speed and do a satisfactory drying job.

Ross Engineers studied the problem and, instead of proposing an additional line, suggested the addition of a section at the head end of the existing dryer. It worked out perfectly. Production was speeded up, output being increased over 50% without a large capital outlay.

Studies of this kind are a significant part of Ross service. They enable owners to decide more intelligently whether an entirely new unit or a modernization of an existing unit should be authorized to obtain the needed increased production.

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Chemurgy technical representatives are anxious to serve you.

25

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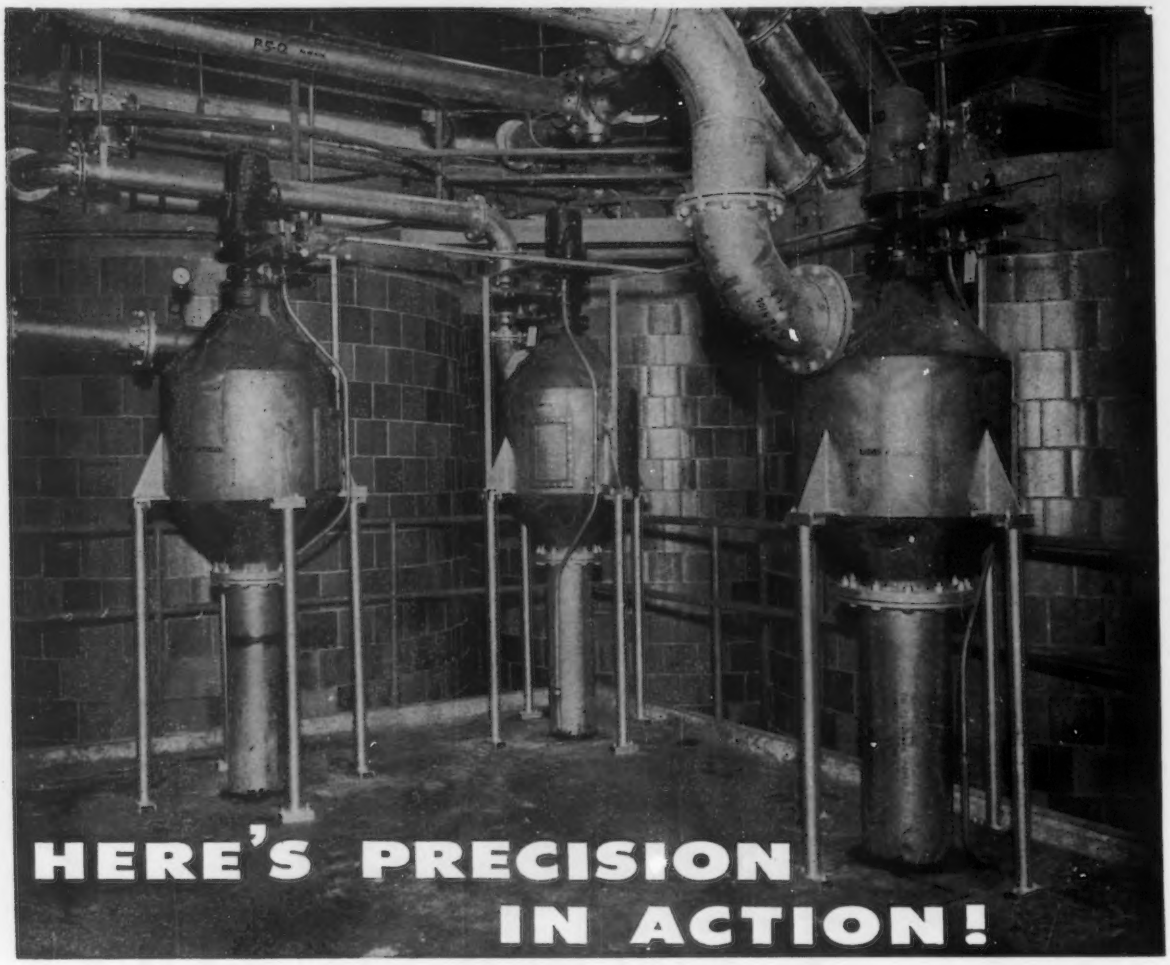

DeZURIK STOCK CONSISTENCY REGULATORS

These are three of the eight DeZurik Regulators in an installation engineered by Charles T. Main, Inc., for the Chillicothe Paper Co. in Ohio on their No. 4 paper machine.

These DeZurik Regulators are designed to handle the full volume of stock—not just a sample.

DeZurik Consistency Regulators have a long record of accuracy, proved in performance. They're guaranteed to hold consistencies within limits of plus or minus .1% and many of them installed directly ahead of paper machines are holding consistencies to plus or minus .02%!

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With quality control becoming increasingly important in paper mills, the accuracy of a DeZurik Stock Consistency Regulator is your guarantee that—without constant attention—without costly maintenance—you can achieve precise consistency control.

For more information on DeZurik Automatic Recording Stock Consistency Regulators, please write

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continuous digester-

A 300 AD ton per day unit

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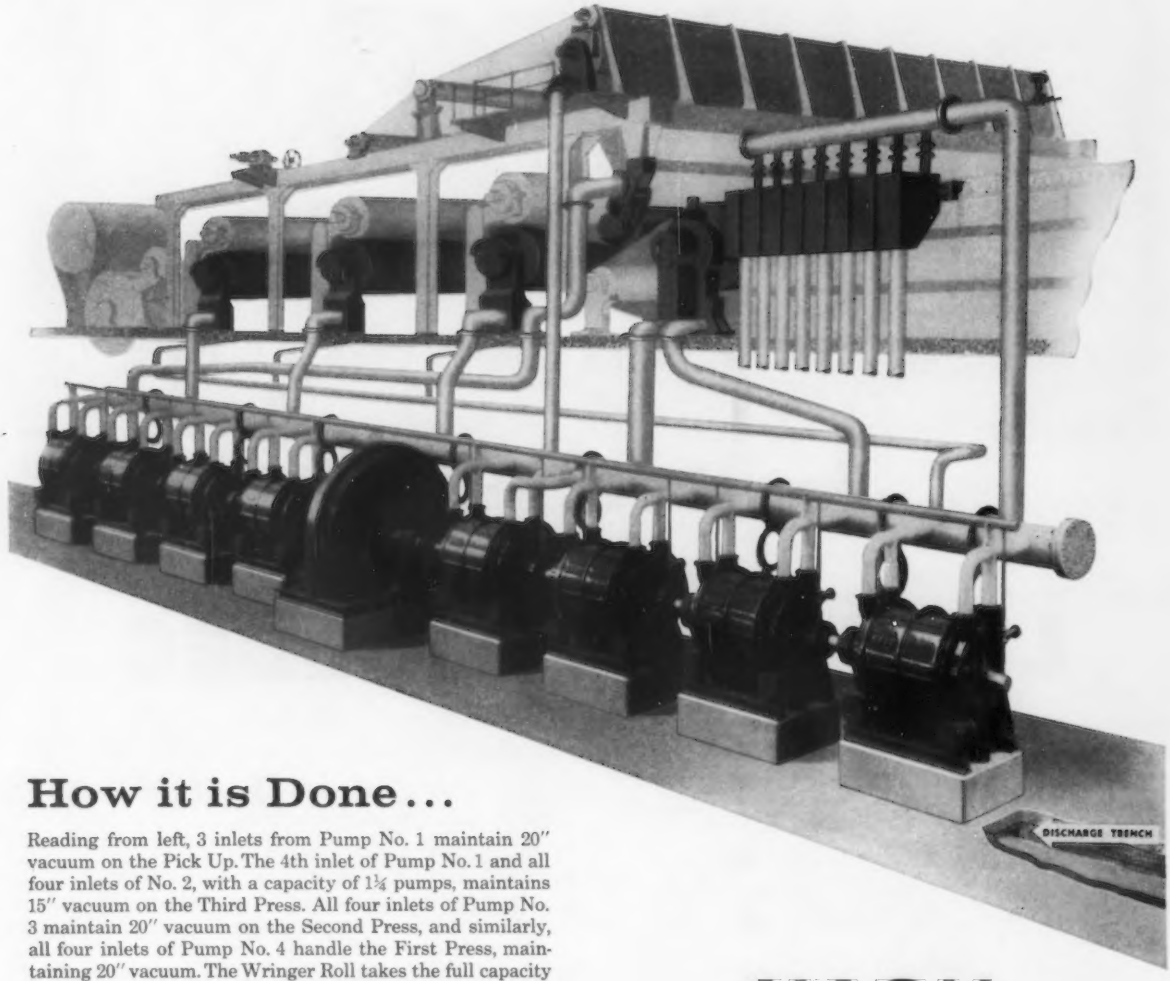
NOW-

Nash Vacuum Pumps of one size, driven if desired, by a single motor, will handle all of the varied vacuum and capacity requirements of an entire Paper Machine.

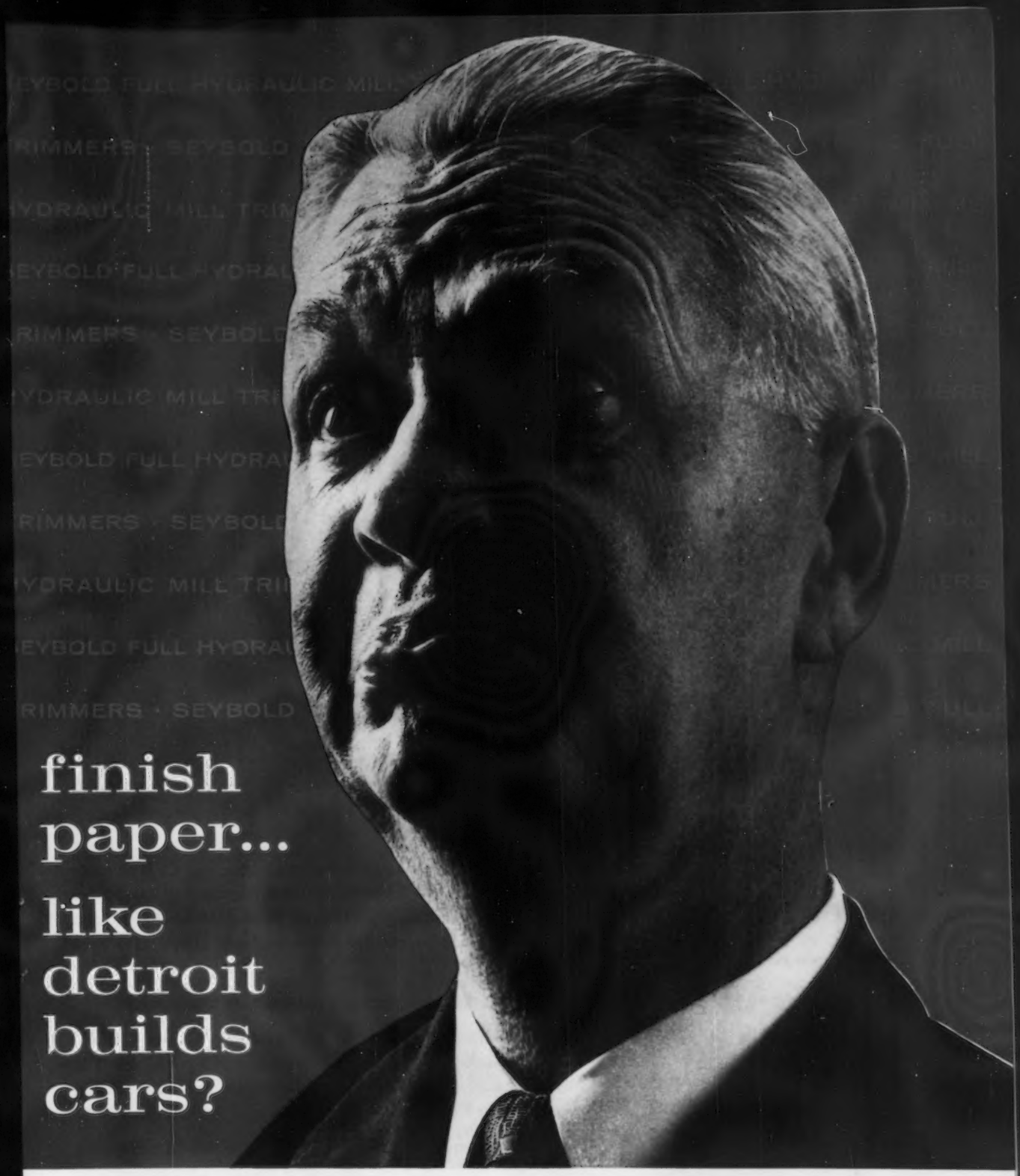
Designed by Nash especially for Paper Mill service, the new 5308 vacuum pump has four separate suction inlets, each of which functions independently of the others. This offers the machine operator great flexibility, since these may be used in any desired combination to produce the variety of capacities and vacuums required by the various functions of a paper machine. These may be varied at will. Great simplicity of operation, and economy of maintenance results. The enclosed discharge trench makes possible a comparatively silent installation and permits easy and economical water recovery.



How it is Done...

Reading from left, 3 inlets from Pump No. 1 maintain 20" vacuum on the Pick Up. The 4th inlet of Pump No. 1 and all four inlets of No. 2, with a capacity of 1¼ pumps, maintains 15" vacuum on the Third Press. All four inlets of Pump No. 3 maintain 20" vacuum on the Second Press, and similarly, all four inlets of Pump No. 4 handle the First Press, maintaining 20" vacuum. The Wringer Roll takes the full capacity of Pump No. 5, requiring 10" vacuum. The High Vacuum Couch Box takes a pump and a half, 4 inlets of Pump No. 6, and two inlets of Pump No. 7, maintaining 20" vacuum. The remaining two inlets of Pump No. 7 maintain 10" vacuum on the Low Vacuum Couch Box. Only one inlet of Pump No. 8 is required to handle the Felt Conditioners at 10" and the remaining three inlets of Pump No. 8 handily maintain 10" vacuum on the Wire Boxes.

NASH
ENGINEERING COMPANY
South Norwalk, Connecticut



A lot of mills are doing it. Right now. With mechanization. They're streamlining material flow. Using air-film tables, for instance . . . conveyors, lifts and Seybold Full Hydraulic 65," 85" and 100" mill trimmers—the only full hydraulics. They're cutting costs—boosting tonnage. The figures are fantastic. So much so, you'll never believe them if we quote them. So join us on a plant tour . . . write today.

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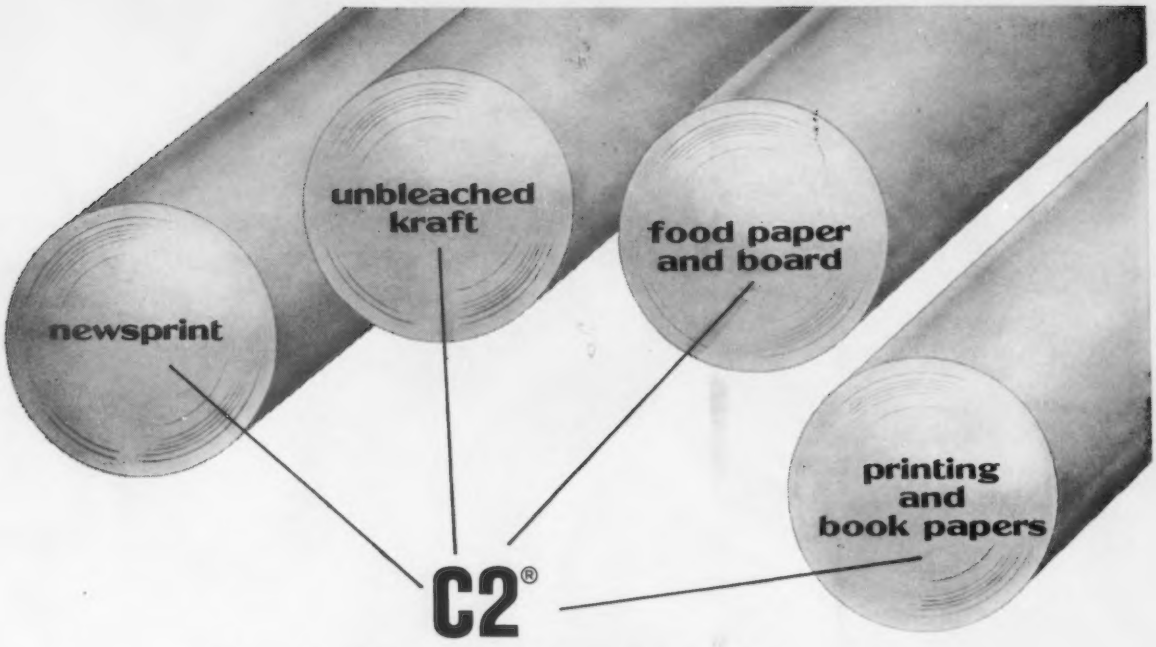

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★ **FDA approved**

★ **effective**

★ **easy-to-use**

★ **economical**

Food and Drug Administration states that sodium chlorite slimicide is not a food additive in paper manufacture because it cannot become a component of food through this use. C2, of course, is the Olin Mathieson trademark for sodium chlorite slimicide.

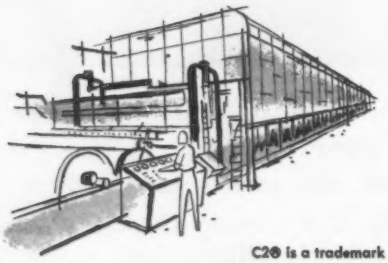
Extensive experience in many mills demonstrates that C2 is an effective, low-cost slimicide for machines producing many types of paper including newsprint, unbleached kraft, food paper and board, and printing and book papers. No detrimental side effects have been observed.

C2 is readily soluble in water and is non-corrosive to equipment.

Average use level is 10 to 20 cents per ton of pulp. C2 is available in quantities ranging from one pound samples to 100 pound drums in truckloads and carloads. C2 also can be shipped as a 50% solution in tank cars or highway transports.

For assistance or further information, write the Sales Development Department. Baltimore 3, Md. Data sheet available upon request.

7755



C2® is a trademark

Olin Mathieson
CHEMICALS DIVISION, BALTIMORE 3, MD.

S. R. CHRISTENSEN

International Paper Co., Hudson River Mill, Palmer, New York

high-speed supercalenders

Rugged, dependable, compact . . . Beloit supercalenders are outstanding performers in the calendering of all grades of paper. Their practical design meets the most exacting demands for supercalendering in all widths and at speeds up to 2500 fpm. Features that contribute to Beloit performance are: resilient air-cushioned loading, quick roll change, renewable ways, fully adjustable gibs, complete unwind and rewind tension control, center or surface wind, special sheet threading arrangements, and positive high-speed lifts.

Why not discuss your supercalendering with a Beloit Sales Engineer? You will find his suggestions helpful. Beloit Iron Works, Beloit, Wisconsin.

your partner in papermaking

BELOIT IRON WORKS · PAPER MACHINERY · BELOIT, WIS., U.S.A.

BELOIT

PAPER MACHINERY

PUSEY & JONES ACQUIRED BY

Inglis

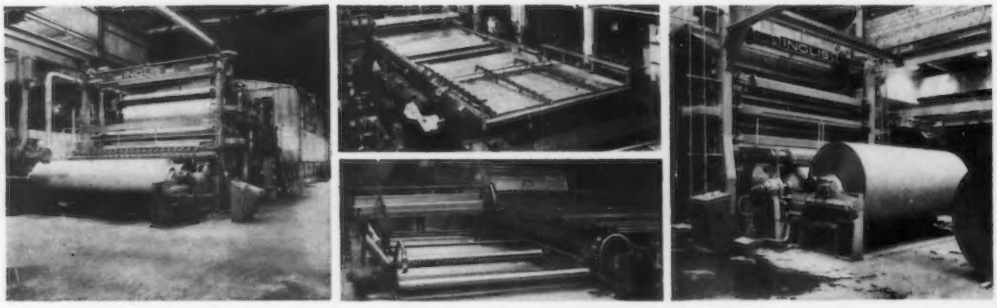
John Inglis Co. Limited, of Toronto, Canada, has purchased the assets of the Pusey & Jones Corporation, paper machinery manufacturers of Wilmington, Delaware. These assets include patents, trade-marks, the right to use trade name "Pusey & Jones", drawings, patterns, tooling, jigs and fixtures, inventories, work-in-process, the widely known Pusey & Jones Plastometer—in fact all assets other than real estate, buildings and machinery.

The John Inglis Company has manufactured pulp and paper machinery for many years, and since 1945 has been associated with the Pusey & Jones Corporation, building paper machines and components in Canada to the Pusey & Jones designs.

With the acquisition of these assets, Inglis is in a position to supply not only new machines, rebuilds, components, etc., but to supply service and spare parts to all customers of Pusey & Jones in all parts of the world.

Enquiries should be directed to John Inglis Co. Limited, 14 Strachan Avenue, Toronto, to the attention of Mr. K. S. LeBaron.

JOHN INGLIS CO. LIMITED 14 Strachan Avenue, **TORONTO, CANADA**



X123

THE Langston Leader
Leadership...by design
SAMUEL M. LANGSTON CO. • CAMDEN 4, N. J.
PAPER MILL EDITION
MARCH, 1960 | *Published for the information of paper and board mills* | VOL. 2, NO. 2

Report on Hurlbut

TWO NEW WINDERS ON FINE PAPER WORK

Operations Produce Sheets Without Surface Scratches For Specialty Paper Field

Two new Langston winders are doing a good job on fine papers at the new Laurel Mill in South Lee, Mass., of Hurlbut Paper Company, a subsidiary of The Mead Corporation.

Both 112-inch wide machines, one is behind the paper machine and the other in the finishing room.

Wide Range of Papers

The paper manufactured by Hurlbut at this mill includes a wide range of fine papers in the specialty field, such as saturating papers for decorative laminate purposes in the furniture field, electrical laminates and high heat insulation.

It also includes various filter papers for aerosol and liquid filtration, photographic use, and special papers for the automotive industry, and for government defense unit needs.

It is a prime requirement that most of these sheets be free of any surface scratch marks or matting of fibres.

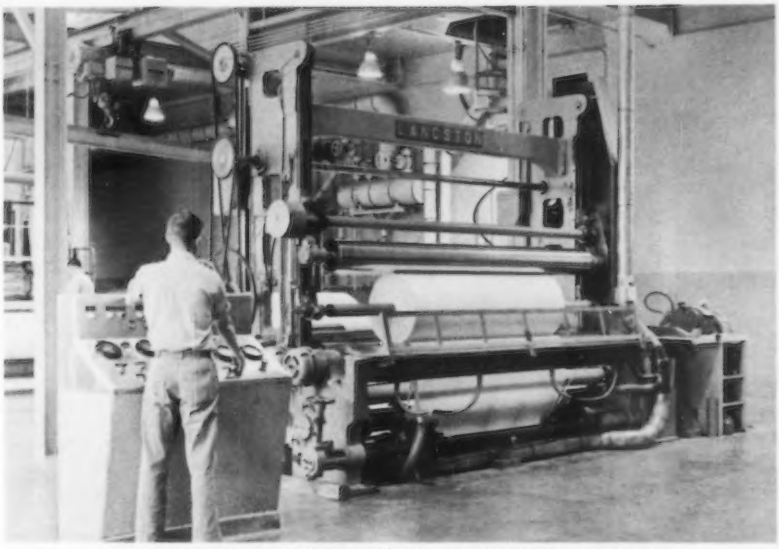
Constant Sheet Tensioning

Grades run on the winders range from 25-lb. to 125-lb. (24 by 36—500 basis). Rolls may vary from 105-inch widths down to 30-inch widths on the rewinder.

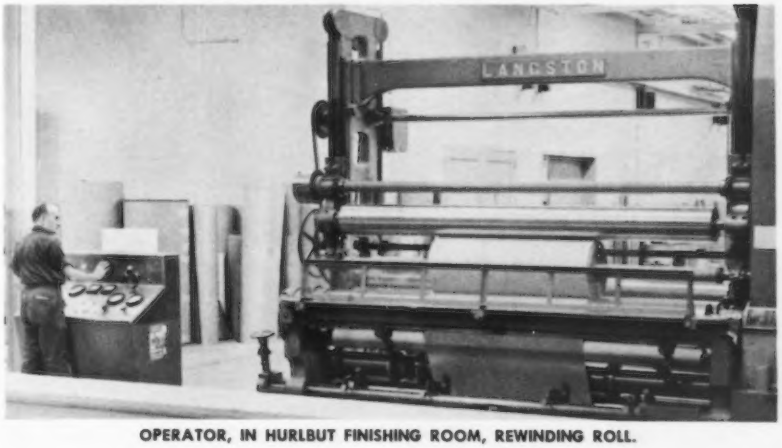
The paper machine winder is equipped with automatic constant sheet tensioning.

"The automatic constant tension control," says Leon P. Tisdale, Plant Superintendent, "can be credited in large part for the good rolls we have been producing. The equipment has worked out well in our operation."

The rider roll arrangement, in particular the controlled torque drive, is easily adjustable to suit varying grades of paper being run and permits the operator at his console to select the amount of rider roll drive effort desired for production of good quality rolls.



LANGSTON WINDER ON PAPER MACHINE AT HURLBUT'S LAUREL MILL.



OPERATOR, IN HURLBUT FINISHING ROOM, REWINDING ROLL.

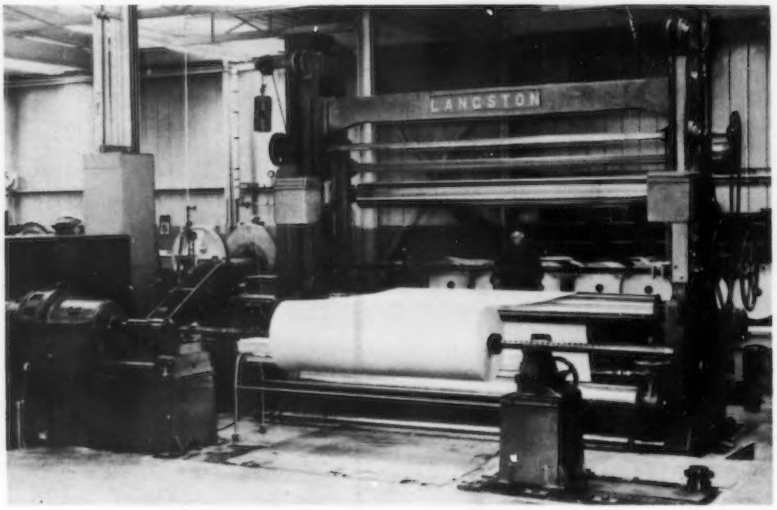
Clean Separations

The rotating-type, cambered spreader roll is positioned to lead the sheet onto the rewind drums and assure clean separations. This spreader arrangement permits precision, clean cut slitting and eliminates scratch and score problems so often encountered with fixed-type spreaders.

Operators like the automatic roll ejector. It makes the work easier and permits quicker roll changes. Also simplifying the job is the gang arrangement of the shear cut slitters for faster setup. Operators like being able to handle all controls from the one

(*Continued on Page 2*)

CLEAN SEPARATION and superior quality of roll are noted by Plant Superintendent Leon P. Tisdale as operator looks on.



BACKSTAND IN FINISHING ROOM shows extended sole plate which is adjustable to various reel widths as required.

Two New Winders

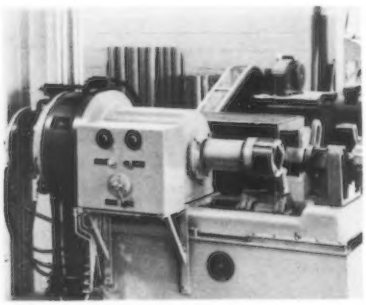
(*Continued from preceding page*)

console, including lateral adjustment of the unwind stand.

Field Weakening Drive

In the Hurlbut operation, the paper machine can run at speeds ranging from 100 feet per minute on heavy papers to 600 fpm on light with the winder operating three to four times faster. Generally, two, three or four rolls are slit and rewound from the 105-inch reel.

Because of the wide range of papers contemplated, it was felt practical to limit the winding of heavy papers to a top speed of 1000 fpm, while still being able to wind lighter weight papers at speeds up to 2000 fpm.



TANDEM BRAKING arrangement and hydraulic closure for reel shaft coupling is shown in closeup.

SETUP on shear cut slitters is made by winderman.

This is accomplished by the paper machine winder drive which utilizes field weakening control, giving constant torque from 0 to 1000 fpm and constant horsepower from 1000 to 2000 fpm.

Tandem Braking

The backstand utilizes a tandem-type braking arrangement. This allows use of one brake for light tensions, one for heavier, while the other is disengaged. Also, where required, both brakes can operate in conjunction. The brakes are pneumatically operated and incorporate thermostatically controlled water cooling.

Because of the range of required tensions, widths of rolls and machine speeds, the winder is so equipped that the operator can easily select by push-button controls the range of sheet tension—heavy, medium or light—that he desires.

The Langston system for automatic tension control is effected through a transmitter mounted on the winder frame. The transmitter receives a sheet tension load indication from a winder-mounted idler roll. The transmitter in turn automatically maintains the tension setting established by the operator.

Quite Satisfactory

"Although we haven't met every condition we expect to meet," says E. K. Bancroft, Director of Engineering, "the braking system appears quite practical and from what we've seen, quite satisfactory."

As for the finishing room rewinder, a speed of 1000 fpm is provided, sufficient for the size rolls handled at Hurlbut's Laurel Mill and when required, permitting visual inspections of the paper at slow speeds. For operation at these speeds, manual brake control has proved adequate for turning out good rolls.

Which of these 3 products and services can you use from BECCO?

New Cold Caustic Bleach Process

Looking for a way to use greater amounts of low-cost, more plentiful pulp—without capital investment for bleach equipment? Then let a Becco Sales Engineer show you our new technique* which allows you to bleach in the same equipment regularly used for the manufacture of cold caustic pulp.

In this new process, peroxide bleach liquor is added at the Bauer Refiner, and bleaching occurs during the refining operation. Bleach response depends on refiner densities.

Up to 20 points brightness increase has been obtained in commercial operations to date, and with no additional steam costs, no holding time, and no excessive chemical costs.

Becco can assist you immediately in setting up a production run and evaluating results. First step: use the coupon to let us know you're interested.

*—Patent Pending

BECCO fmc

BECCO CHEMICAL DIVISION, FMC
Station B, Buffalo, New York
Dept. PTJ-H

Gentlemen:
Please have a Sales Engineer give me more information on Becco's Cold Caustic Bleach Process.

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You can have 'em!
They're FREE!

Years of experience in paper and pulp processing have produced a library of technical information which is available in individual bulletins, free on request. Use the coupon below to let us know which you'd like to receive.

No. 31 — Groundwood Bleaching Variables — A Statistical Approach.

No. 32 — H_2O_2 Bleaching of Chemicals and Mechanical Pulps.

No. 47 — Peroxide Bleaching of Pulps.

No. 48 — High-Density Pulp Bleaching.

No. 64 — Development Studies on Last-Stage H_2O_2 Bleaching of Alkaline Pulps.

No. 65 — Peroxide Bleaching of Southern Pulps.

No. 66 — Becco Laboratory Procedures for Pulp Bleaching, 1955 Ed.

No. 91 — Peroxide Bleaching of Chemi-Mechanical Hardwood Pulps.

No. 92 — Peroxide Bleaching of Chemical Pulps.

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Problems in handling Hydrogen Peroxide

?

Becco's Four-Fold Engineering Service Program—offered free—includes:

1. Comprehensive survey of your facilities.
2. Specific proposal with recommendation of proved equipment and where it is obtainable.
3. Installation supervision by Becco.
4. Periodic inspection and permanent service.

Can you use this free Becco help, based on more years of experience with bulk handling of H_2O_2 than any other manufacturer? Use the coupon to let us know.

BECCO fmc

BECCO CHEMICAL DIVISION, FMC
Station B, Buffalo, New York
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Gentlemen:
Please tell me more about your Four-Fold Engineering Service.

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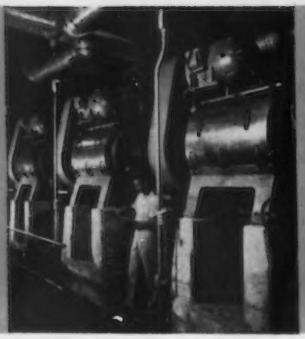
Everything's under control at Buckeye



UNIQUE CONTROL SYSTEM ASSURES HIGHEST QUALITY KRAFTS

It takes more than routine sampling and standard controls to produce outstanding kraft for today's paper industry. At Buckeye, highly specialized equipment and advanced statistical methods maintain desired pulp specifications within extremely narrow limits. A pneumatic tube system shuttles samples of stock-in-process to plant laboratory for detailed analysis. Written operating instructions cover every pulp, every stage, every process condition. Nothing is left to chance.

For highest quality krafts today, tomorrow, and in the years to come, contact Buckeye . . . the market pulp producer with everything under control.

BUCKEYE CELLULOSE CORPORATION

Memphis 8, Tennessee

Wood pulp plant at Foley, Florida

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BUCKEYE PULP

Bleached Kraft

Get out the dirt... *she doesn't see!*

D-I LESTOIL LIQUID DETERGENT

No matter what grade of raw stock you use... no matter what care you take in sorting... there's always the danger that grease, oil, wax and other contaminants will get by — to create specs or shiners or otherwise blemish your finished sheet.

Today... increasing numbers of smart mill operators insure against these costly headaches by adding D-I LESTOIL when cooking rags.

D-I LESTOIL speeds up wet-out, assures uniform packing and cooking in the boiler; thoroughly penetrates every fiber. It emulsifies and disperses grease, graphite, wax... all dirt. Produces fibers free of soil, fibers that bleach readily and absorb dye uniformly.

D-I LESTOIL guards against redeposition of soil ... permits complete, free rinsing.

End result? Clean, bright sheets of uniform color and quality.

FREE!

A generous sample and complete details on how to get better quality paper with d-i LESTOIL!

MAIL THIS COUPON TODAY!

LESTOIL, INC.
A subsidiary of Adell Chemical Co.

LESTOIL, INC.
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Please send me a free sample of d-i LESTOIL and complete directions for use.

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9 KEYS TO EFFICIENT PRESSURIZED REFINING
1. Controlled parallel feed
2. Twin refining surfaces
3. Floating rotor shaft assembly
4. Hydraulically controlled refining head
5. Compact accessible automatic controls
6. Easy access and minimum maintenance
7. Wide choice of plate designs
8. Rugged, dependable construction
9. Choice of 26", 34" or 42" size with motors up to 1250 horsepower
SPROUT-WALDRON

SPROUT-WALDRON PRESSURIZED REFINER

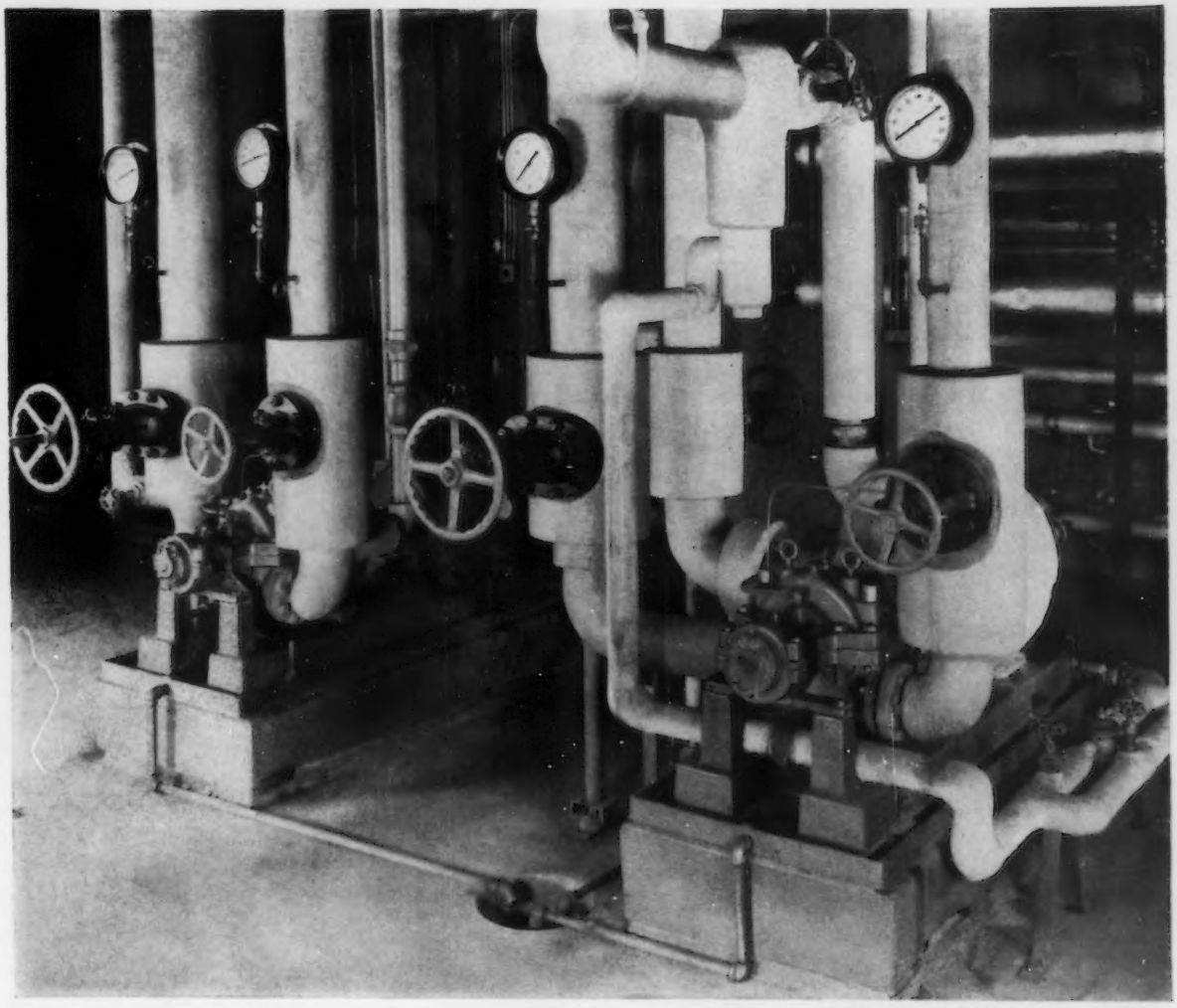
twice the normal capacity in a single unit

Here is a new type stock preparation refiner designed for superior quality control, low operating costs and minimum maintenance. The parallel feed arrangement serves twin refining surfaces, giving twice the capacity of standard single disc units. Key to refining accuracy and dependability is the floating rotor shaft disc assembly which rotates between the fixed and hydraulically controlled movable heads. The flow of pulp is equally distributed between both sets of plates assuring uniform refining and even plate wear. If you are looking for mechanical simplicity, high production and uniform quality, plus low operating and maintenance costs, get the facts on the Sprout-Waldron 26", 34" and 42" pressurized refiners. Bulletins available on request.

SPROUT, WALDRON & CO., INC.

MUNCY, PENNSYLVANIA, U.S.A.

E/204 SINCE 1866 REFINERS • CONVEYORS • FEEDERS • SCREENS • MIXERS • DRAINERS • FIBER PRESSES • STOCK PROPORTIONERS



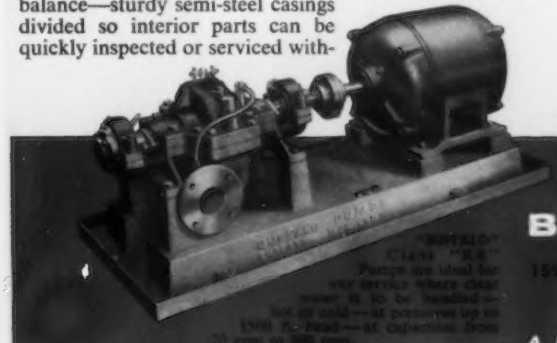
Another Boiler Feed Installation Featuring "Buffalo" Type "RR" Pumps.

YOU CAN'T *"High Pressure"* THIS "BUFFALO" PUMP INTO WEARING OUT FAST ON BOILER FEED!

Top efficiency, utmost dependability, and long life are the factors you want most in high pressure pumps for boiler feed water service. Here's why you get these benefits in "Buffalo" Type "RR" Multi-Stage Pumps:

Rugged, reliable "Buffalo" construction includes highly-efficient bronze impellers designed for consistent hydraulic balance—sturdy semi-steel casings divided so interior parts can be quickly inspected or serviced without breaking pipe connections—husky bronze labyrinth type wearing rings—high tensile strength steel shafts for long wear—heavy-duty duplex angular contact bearings protected by dust-proof housing. These and many more "Buffalo" Type "RR" features assure you of the finest boiler feed pumps obtainable for pressures up to 500 psi.

Find out today why and how "Buffalo" Type "RR" pumps deliver more water at less expense for power and maintenance. Call your "Buffalo" engineering representative, or write for Bulletin 980-E.



BUFFALO PUMPS

Division of Buffalo Forge Co.
159 Mortimer St. • Buffalo, N. Y.
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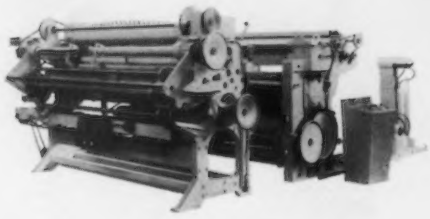
"Buffalo" PUMPS

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

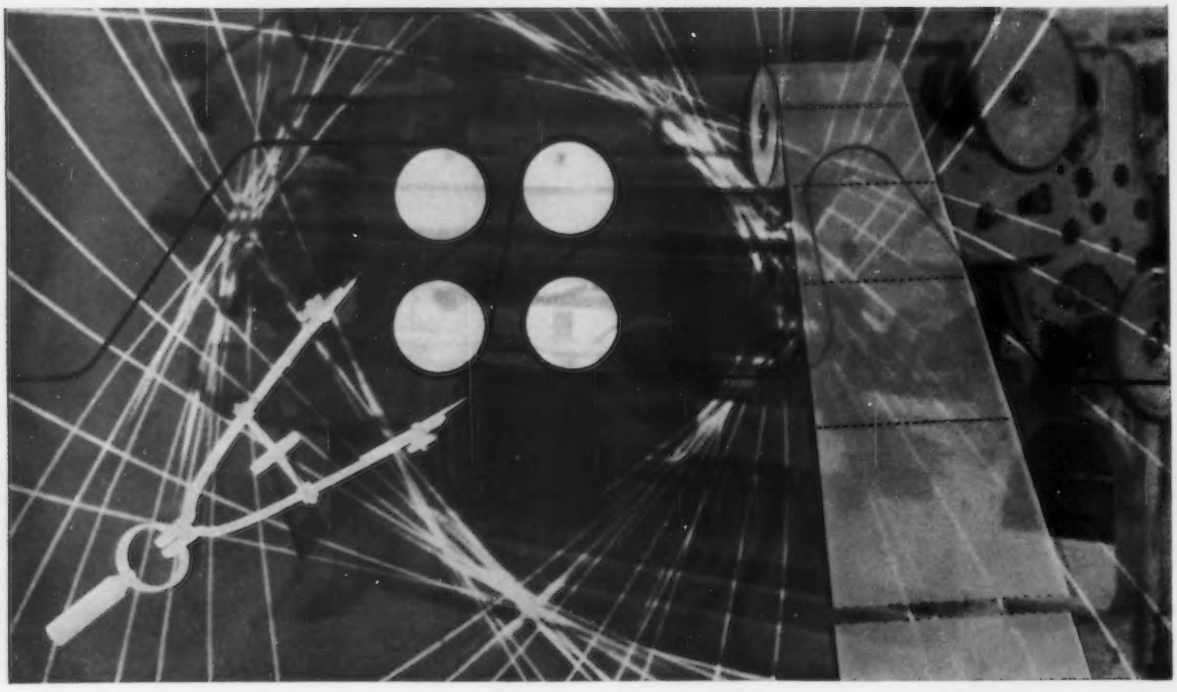
Creative engineering and development of converting machinery



New Rewinder — over 1,000 feet per minute, completely automatic! This new Model 2481 90″ Rewinder operates continuously at speeds over 1000 feet per minute, automatically transferring the web for each set of rolls while running at full speed. One operator easily operates two of these rewinders because the mandrels remain in the machine and the automatic core loader eliminates manual labor. It has Paper Converting's new Shear-Cut Perforator, micrometer adjustment for accurate control of nip pressure on embosser, 60″ diameter jumbo rolls with automatic constant tension dancer roll control. The ideas in this rewinder typify the *creative* engineering in all our converting machinery. Ideas that mean profit on your production line.

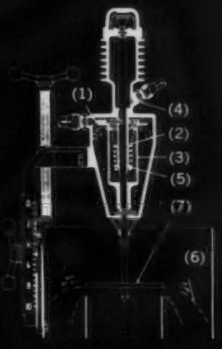
PAPER CONVERTING MACHINE COMPANY · GREEN BAY, WISCONSIN

Folders, Rewinders, Embossers, Napkin and Core Machines, Letterpress and Flexographic Presses, Special Converting Machinery



KÄLLE

"FLOATING DISC" INDICATOR Type K22S FOR LOW PULP CONSISTENCIES



OPERATION

Water under constant pressure spins turbine (1) creating a vortex (2), whose depth is determined by the speed of rotation of the vessel (3). An air stream, introduced at (4), measures, through the bubble-pipe principle, the distance between (5) and the bottom of the vortex, thus determining the degree of consistency of the stock suspension (6) which exerts a friction drag on the spinning "Floating Disc" (7).

Precise regulation at any rate of flow

TYPE K22K
For higher consistencies. Conical sensing element measures consistencies of 1.5% to 6%.

Accurate pulp consistency measurement is the crucial factor in your flow control system... and the new Kalle, "Floating Disc" consistency indicator gives you accurate measurements of consistencies between 0.5% and 1.5%. Kalle consistency indicators are rugged and reliable units that will serve you year after year with a minimum of maintenance. Information from the indicators may be utilized by your present flow control system or transmitted to the Kalle controller which automatically adjusts dilution rate to conform with required consistencies. Kalle systems and instruments are saving man-hours and increasing efficiency in leading pulp and paper mills throughout the world. Write for full particulars today.

ROSENBLAD CORPORATION
1270 SIXTH AVENUE, NEW YORK 20, N. Y.

REPRESENTATIVES IN PRINCIPAL AREAS.....

*Idea submitted by L. D. Nicolson, Hamilton Paper Company, Plainwell, Michigan

Photo by Harold M. Lambert

HAM FELTZ says:

"Reminds me of HAMILTON Felts . . . Highest Quality!"

*WIN . . . *A NEW Shakespeare Spincast Fishing Outfit!*

"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each month, the idea from a papermaker that we use wins a new 1960 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. *Every papermaking entrant* receives a famous Rex Spoon fishing lure—FREE. Send me your suggestion—today. Ham Feltz, 612 First National Bank Bldg., Cincinnati 2, Ohio."

YOU CAN'T BEAT

Hamilton

FELTS

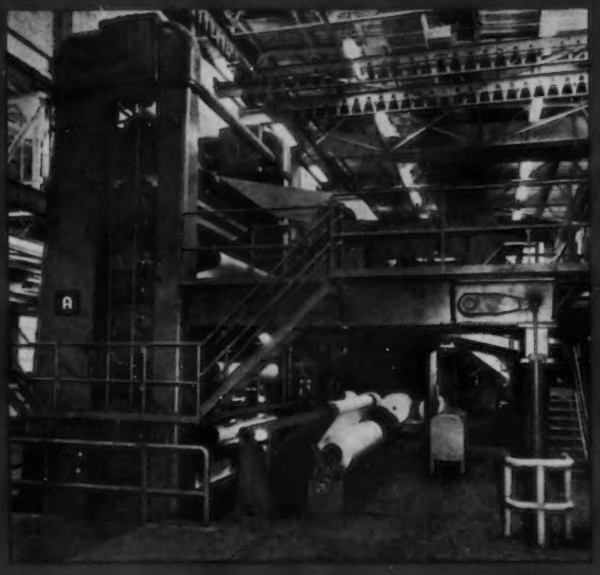
Rising 555 feet,
the graceful Washington Monument
towers above all other structures in Washington, D.C.—
just as—for quality and efficiency—Hamilton Felts
seem to tower above all other felts.
Since 1858, papermakers have found that
Hamilton Felts give longest quality performance
and less broke between change-overs.

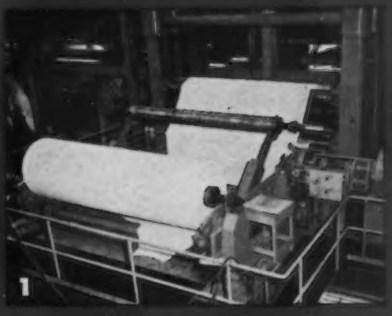
"Hamilton Felts are 'water conditioned'
to run water like a sieve,
deliver drier sheets to the driers,
permit operators to run machines
at higher speeds with fewer stops."

If one of our 300 modern,
technically proven styles
won't so!ve your specific problem,
we'll be happy to design
a Hamilton Felt that will.
Just ask your Hamilton Felt Service Salesman.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

The Mead Corporation uses NEWEST in Spool Transfers





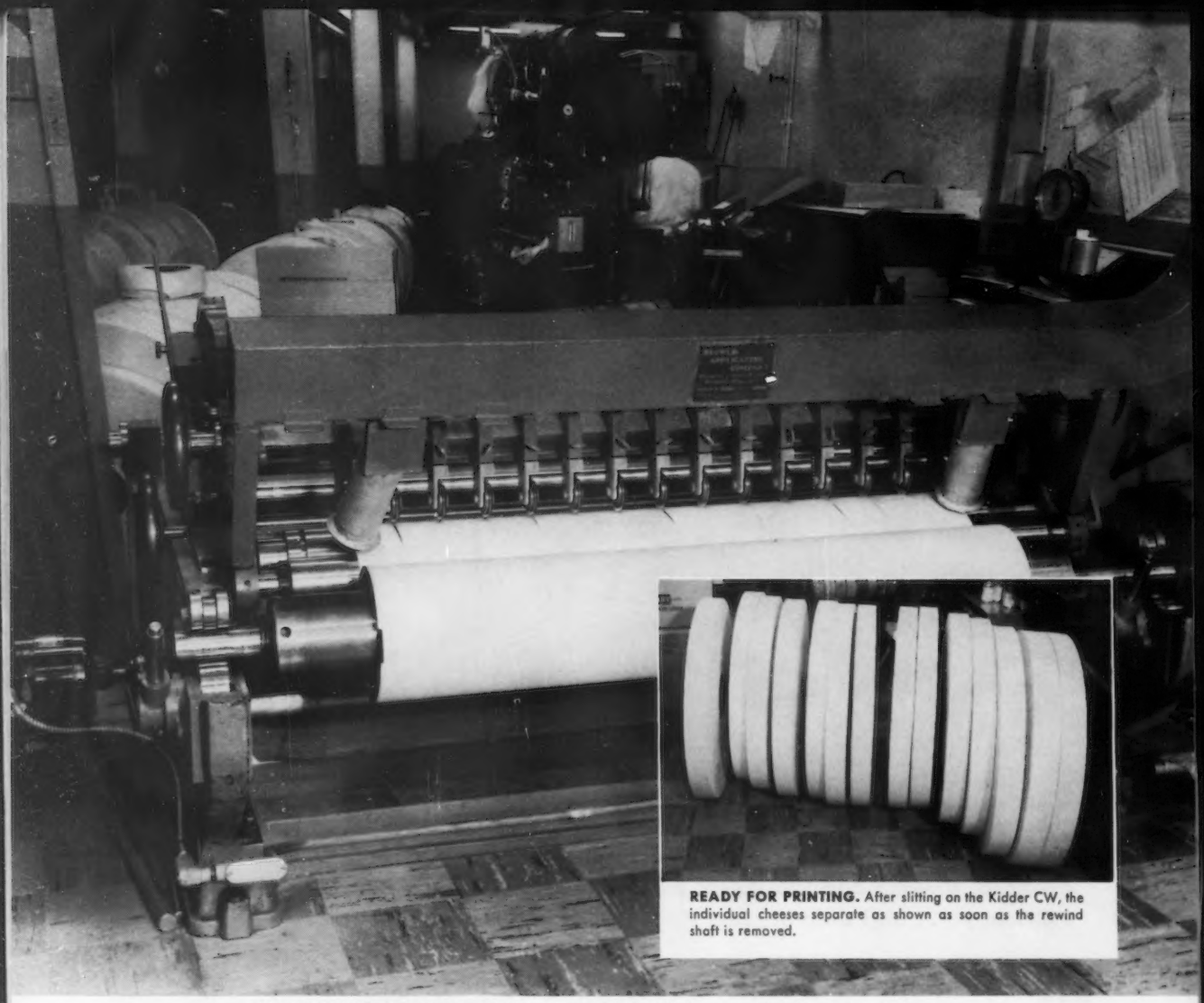
Appleton's push-button, automatically sequenced, Unwind and Windup is designed for efficiency . . . and *delivers* just that!

Illustrations show the Mead Corporation, Chillicothe Division, installation of this newest of Unwind and Windup units on an Appleton supercalender.

Sequence photographs portray how: (1) Arms raise spool from unwind bearings and return to horizontal "park" position. (2) Parent roll is mechanically conveyed on dollies into unwind position. Spool is clamped in place pneumatically. (3) Wound roll is removed from windup stands by tilt top elevator. (4) Spool is lowered into windup bearing saddles. Arms automatically retract to "park."

Your inquiries are invited and complete specifications will be furnished promptly upon receipt of basic data.

APPLETON MACHINE COMPANY
Appleton, Wisconsin



READY FOR PRINTING. After slitting on the Kidder CW, the individual cheeses separate as shown as soon as the rewind shaft is removed.

READY FOR SLITTING. A Kidder CW Slitter, special Tab Card Model, with card stock threaded onto the core.

The Punch Card Favorite for Speed, Accuracy, Economy

First choice in the punch card business for many years, the Kidder regular duty Type CW Slitter is now available — new, improved and low in cost.

A special Tab Card Model meets all punch card requirements. If Carroll presses are to be used for printing cards, a special rewind shaft to accommodate plastic molded cores is supplied. If New Era presses are used, a pneumatic rewind shaft for 5″ I.D. paper cores is installed. A new high in web speed, 2000 FPM, is now obtainable with a 20 h.p. motor — or a 15 h.p. motor provides a maximum of 1500 FPM.

Accuracy to plus or minus, one one-thousandth of an inch (.001″) is assured, and the shear-cut principle results in completely severed webs, smooth edges and *no dust*. For details, contact the KIDDER PRESS COMPANY, INC., Dover, New Hampshire. Eastern Sales Office: Empire State Bldg., New York 1, N. Y. Midwest Sales Office: 400 Washington Bldg., Madison 3, Wisconsin. West Coast Representative: Bojanower Machinery Corp., 5270 E. Washington Blvd., Los Angeles 22, California.

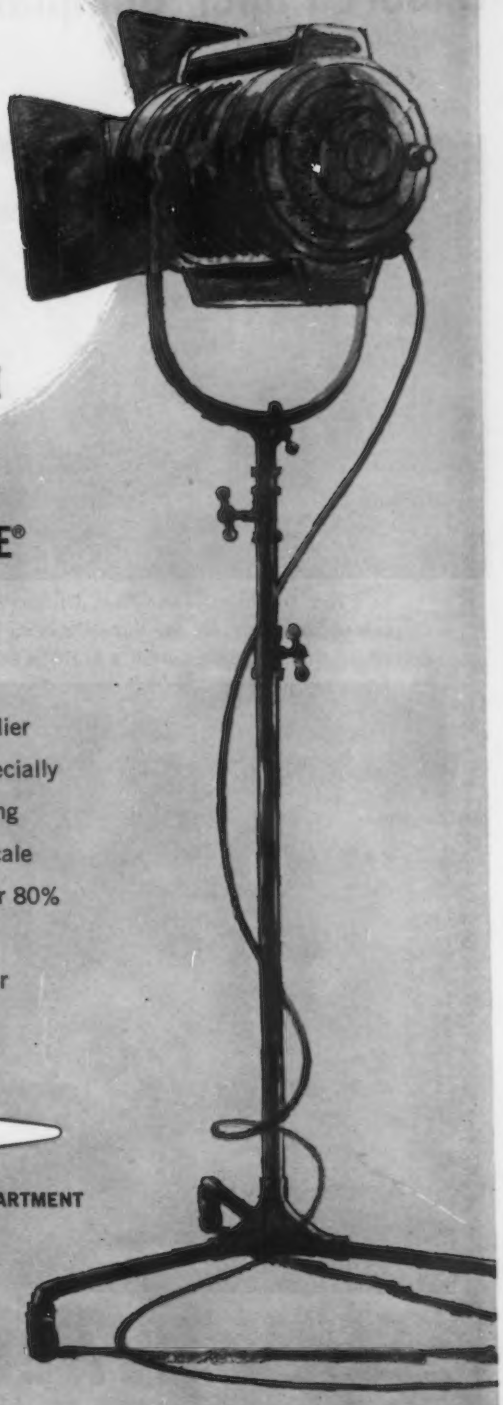
Make Good Impressions Faster with

Kidder

Slitters and Rewinders, Flexoprinter®, Letterpress and Gravure Presses

ACCOBRITE

LIGHTEST COLORS IN THE ROSIN SIZE SCALE AVAILABLE IN ACCOBRITE® ROSIN SIZES



These efficient unfortified gum rosin sizes are proving they can equal the results of far costlier fortified sizes in many mills. Features include especially bright color, high sizing efficiency, low foaming qualities. The lightest colors in the rosin size scale are available in Accobrite. Shipped at 70% or 80% solids, and dry form. For further information and any technical assistance you need, call your Cyanamid paper chemicals representative.

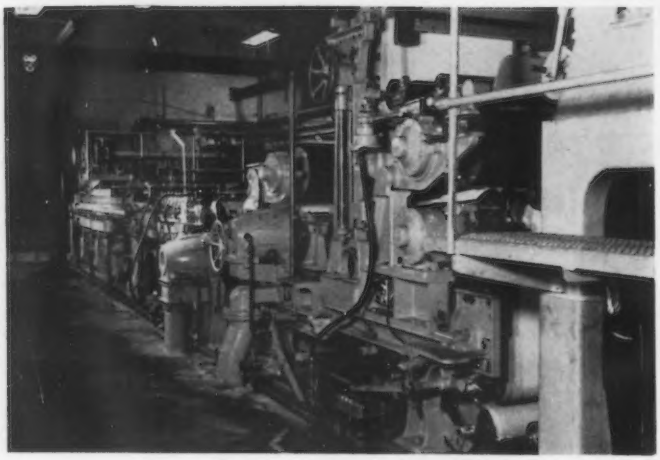
CYANAMID

AMERICAN CYANAMID COMPANY • PAPER CHEMICALS DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.

"THE VALLEY QUEEN"

Gilbert Paper Company's New No. 2 Paper Machine

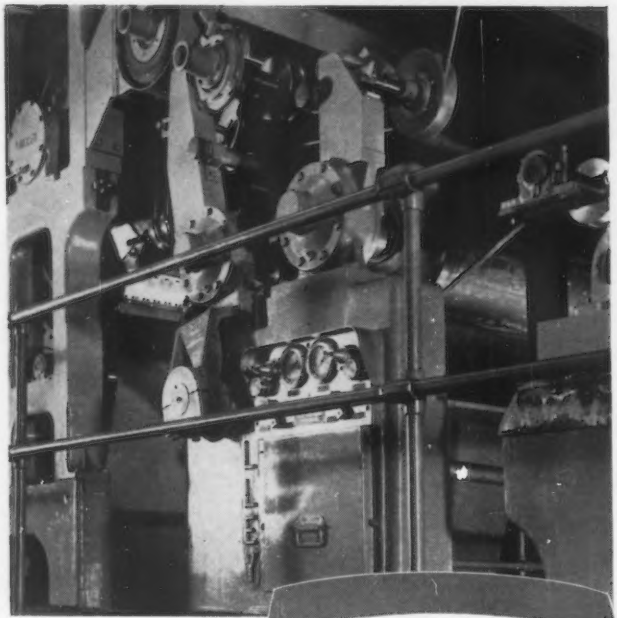
by . . . VALLEY



From the Inlet to the Reel, Gilbert's new machine incorporates the latest in design with maximum built-in flexibility.

Valley Dryer Sections with Smoothing Press, Horizontal Breaker Stack, and Horizontal Size Press, specially elevated to permit all return felts to operate above floor level.

Valley Horizontal Size Press gives superior performance with precise positive built-in control. Valley supplied the complete paper machine.



for your paper machine requirements consult... VALLEY

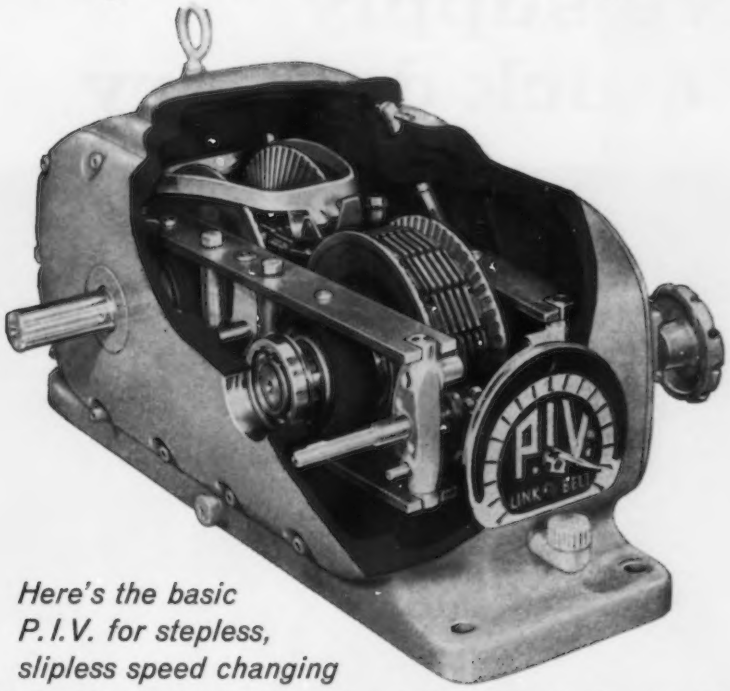
VALLEY IRON WORKS CORPORATION

SUBSIDIARY OF ALLIS-CHALMERS MANUFACTURING COMPANY

APPLETON, WISCONSIN

LINK-BELT P.I.V. is available in all these ways for

super-sensitive quality control



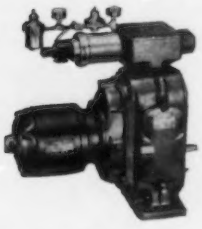
Here's the basic P.I.V. for stepless, slipless speed changing

Today a growing number of production machines and operations demand extremely accurate transmission of power with variable speed control. For these requirements, Link-Belt P.I.V. is available in the many ways shown below—with automatic controls and integral differential to satisfy an infinite number of variable speed applications.

Variable from top speed to minimum speed with no steps, no stops in between, Link-Belt P.I.V. is industry's only chain-driven variable speed drive. Teeth—not tension—permit positive, high-efficiency power transmission.

For information on the full P.I.V. line, call your nearest Link-Belt office or authorized stock-carrying distributor. Or write for Book 2274 on basic P.I.V., Book 2349 covering automatic controls and Book 2774 explaining P.I.V. with integral differential.

Link-Belt P.I.V. is available in 8 sizes and 16 standard types, in capacities from ½ to 25 hp—for horizontal or vertical mounting. Compact design simplifies installation as a separate unit or a built-in part of a machine. P.I.V. is totally enclosed, automatically lubricated.



PNEUMATIC (shown) — The P.I.V. pneumatic ratio changer is used as a final control element providing fully automatic control of speed. Operates from standard pneumatic controller in systems regulating pressure, temperature, rate of flow, etc.

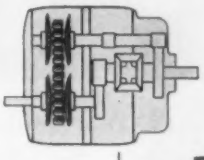
MECHANICAL — Predetermined timing, cyclic, or characterized regulation can be accomplished by P.I.V. with mechanical controls.

HYDRAULIC (shown) — Consists of a low-pressure hydraulic Servo system with a precision valve positioner. Intended to give automatic speed control by direct operation with any form of linkage. A minimum operating force is required.

ELECTRONIC — Flexible form of speed control to provide either "on-off" or modulated speed response of P.I.V. drive. Electric control motors are available to match a wide variety of electrical control systems.

P.I.V. with integral differential gearing

CONDENSED SPEED RANGE TYPE of integral differential results in a ratio range less than a standard P.I.V. with the advantage of increased horsepower capacity, high ratio stability and accuracy. These drives are applicable wherever small ratio range is required but with extreme accuracy of ratio control.



EXTENDED SPEED RANGE TYPE of integral differential results in infinite ratio range and output speeds down to zero with a constant input speed. Clockwise and counterclockwise rotation through zero is also obtainable. These drives may be used whenever a ratio range greater than 6 to 1 is required.

P.I.V. LINK-BELT
THE SYMBOL OF QUALITY
VARIABLE SPEED DRIVES

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 15,182

POWELL
giant in-stock valve supply for quick delivery

Powell maintains one of the largest in-stock supplies of bronze, iron, steel and corrosion resistant alloy valves in the world. So you can receive immediate valve delivery from Powell's factories or your nearby distributor's stocks and avoid costly operational delays or plant shutdowns.

For quick action, just pick up your phone and contact your local Powell Valve distributor or The Wm. Powell Company direct. With our 114 years of valve manufacturing experience, we can fill your valve needs and solve your valve problems! Let us hear from YOU—TODAY!

THE WM. POWELL COMPANY DEPENDABLE VALVES SINCE 1846 CINCINNATI 22, OHIO **world's largest family of valves**

Bauer Pump-Through Refiners

refining waste paper

Users of Bauer Pump-Through Refiners working on waste paper for boxboard, liner, 9-point, etc., report how they . . .

● SAVE POWER

A single pass through one refiner produces stock fiberization and dispersal which can not be equalled even by a series of several jordans.

● IMPROVE QUALITY

These refiners preserve fiber length. Stock is therefore stronger and freer draining. This provides improved formation, improved quality.

● INCREASE MACHINE SPEED

Better formation means better runnability, increased operating speed.

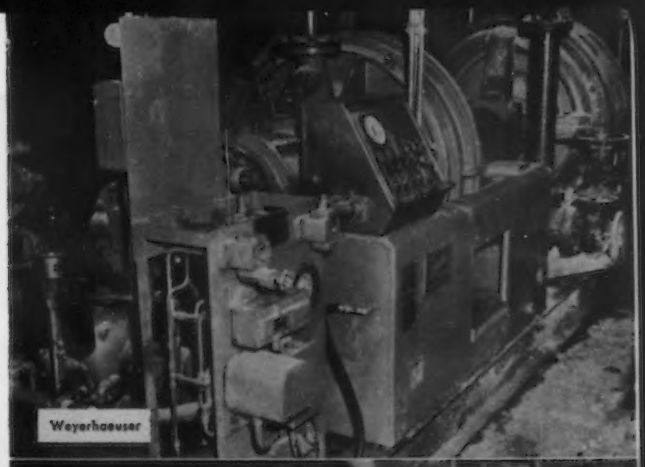
● REDUCE LABOR COSTS

Low cost of plates, and ease of changing them, reduces labor costs, maintenance and downtime.

Talk to your Bauer representative . . . see for yourself why so many waste paper and de-ink mills are using Bauer Pump-Through Refiners.

THE BAUER BROS. CO.

SPRINGFIELD, OHIO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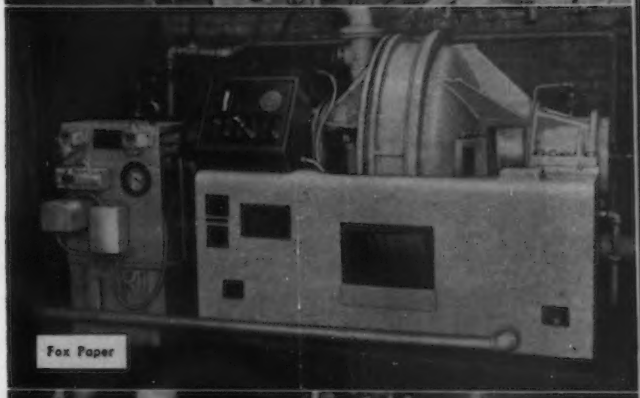
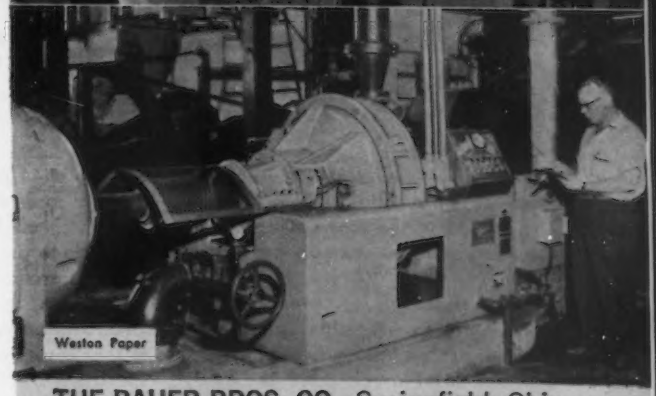

Fox Paper

Michigan Carton


Weston Paper

THE BAUER BROS. CO., Springfield, Ohio

Send me more information on refining waste paper.

Name_____

Title_____

Company_____

Address_____

The Labors of Hercules

Better Papermaking Chemicals

Better Technical Assistance

Mythology—*Becoming a hero in Greek mythology was apparently not easy. One of the twelve labors assigned to legendary Hercules was to transport the famous Cattle of Geryon to greener pastures. While this may have seemed a simple job, its execution called for Hercules to singlehandedly build roads and causeways as he drove the herd through previously untravelled territory.*

Progress—Unlike the Hercules of mythology, modern Hercules doesn't have to build roads to transport its papermaking chemicals. By highway and rail, high-quality chemicals, manufactured under exacting quality control measures, are available to you when and where you want them. To insure a dependable supply of these products for you, Hercules maintains plants and warehouses strategically located from coast to coast wherever papermaking chemicals are required. In addition, Hercules conducts a continual research and development program, at four separate laboratory locations and offers the assistance of over fifty field specialists highly trained in papermaking techniques. The modern Hercules is ready to labor on your behalf.

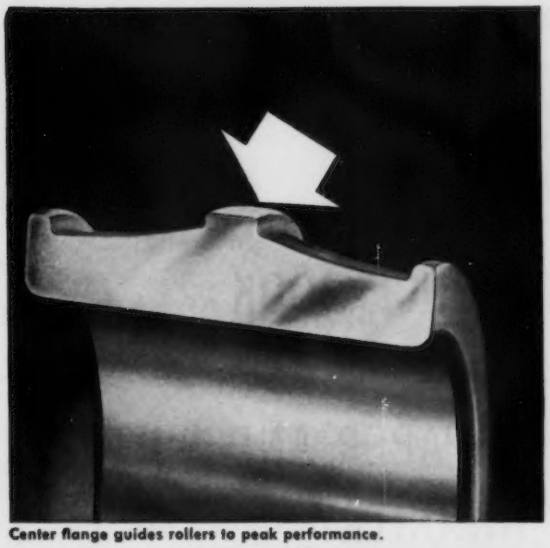
PP60-1

Paper Makers Chemical Department

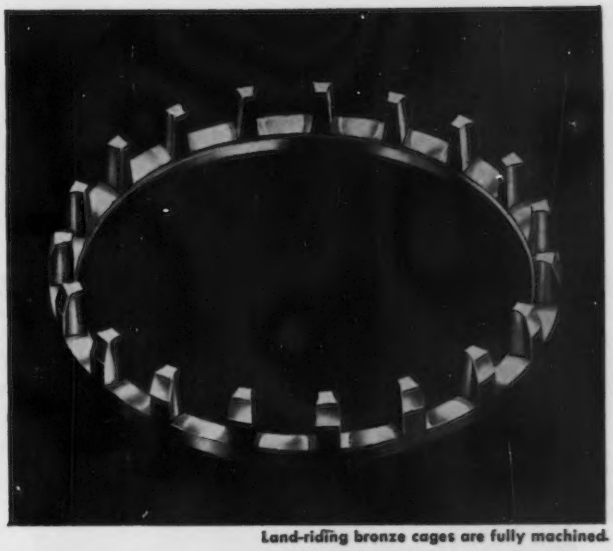
HERCULES POWDER COMPANY

INCORPORATED

Wilmington 99, Delaware

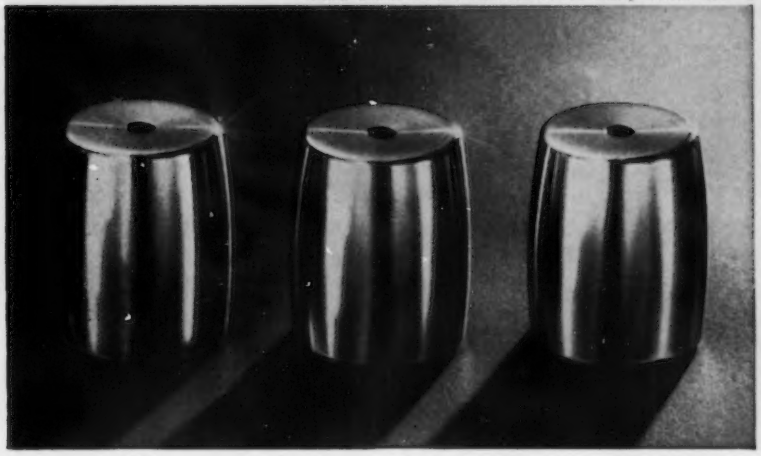


Center flange guides rollers to peak performance.



Land-riding bronze cages are fully machined.

Roller diameters are matched electronically within .0001".



Consider every design feature and you'll choose Torrington!

Torrington has compromised none of the operating design features of its Spherical Roller Bearing, because application experience has proved them essential to superior bearing performance.

There's no substitute for the stabilizing effect of the integral center guide flange. Torrington's asymmetrical roller seeks this flange under load. Skewing and stress concentrations are eliminated. Every roller carries its share of the load, for roller diameters are matched electronically within .0001" for even load distribution.

Rollers are precisely spaced by fully machined land-riding bronze cages that withstand even the high stresses of eccentric service. Two independent cages, one for each row, prevent roller drag and side stresses under thrust loads. Size-stabilized races prevent "growth" or change in dimension in service.

These features mean a cooler-running, longer-lasting bearing. When you buy bearings, look into *every* detail, and you'll choose Torrington.

Superior performance features of
TORRINGTON SPHERICAL ROLLER BEARINGS:

- Integral guide flange for roller stability
- Asymmetrical rollers seek flange for positive guidance
- Electronically matched rollers
- Size-stabilized races
- Fully machined land-riding bronze cages
- Controlled internal clearances
- Even load distribution
- Inherent self-alignment
- Long service life

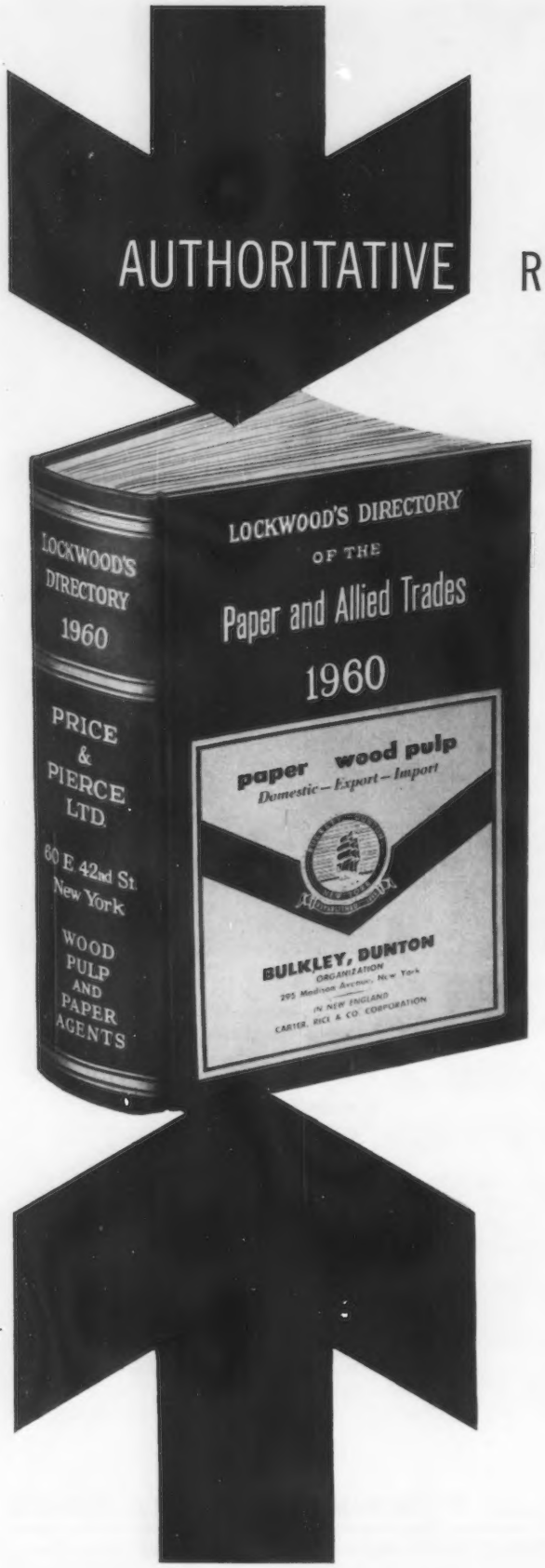
Send for new Spherical Roller Bearing Catalog No. 258

progress through precision

THE TORRINGTON COMPANY

TORRINGTON BEARINGS

South Bend 21, Indiana • Torrington, Conn.



REFERENCE BOOK OF THE PAPER AND PULP INDUSTRY

used all year in the trade

The Directory contains production and personnel data on every pulp and paper mill in the U. S. Every copy of *Lockwood's Directory* is sold for $12, with the exception of one copy to advertisers for checking purposes; none to agencies.

In addition, buyers for paper and pulp mills turn to *Lockwood's Directory* at the time they're ready to place orders because this is the one complete, accurate, one-volume source of all suppliers and technical services, completely up-dated every year. It is a must for new personnel, a handy reference for all.

works all year for advertisers

Companies that *sell* to the paper and pulp industry can use *Lockwood's Directory* to anchor their basic story where buyers will see it at the time they're looking for sources. Your advertisement is always "on duty," supplements and backs up other sales effort and advertising.

The cost of this "insurance" advertising in *Lockwood's* is small – only $200.00 a page.

Reserve space now for the 1961 edition, closing August 1.

LOCKWOOD'S DIRECTORY

49 West 45th Street, New York 36, N. Y.

Trends

Paper Mill Rates Soar Board Mills Lag

Paper mills ran in excess of 98% of capacity during the month of March while board mills ran at 94%. This is the highest operating rate for the paper mills since the spring of 1956.

Pulp Production Running Ahead 10%

Total U. S. pulp production in February was 10% higher than same month last year. Market pulp shipments were up 4% for domestic and 41% for export. For the year to-date production is up 8% and domestic shipments +3% and exports +41%.

Drop in Dissolving Pulp Prices

We have had an unconfirmed report that there have been price cuts of between 5 and 10% for a number of grades of dissolving pulps.

Canadian Pulp Running Ahead

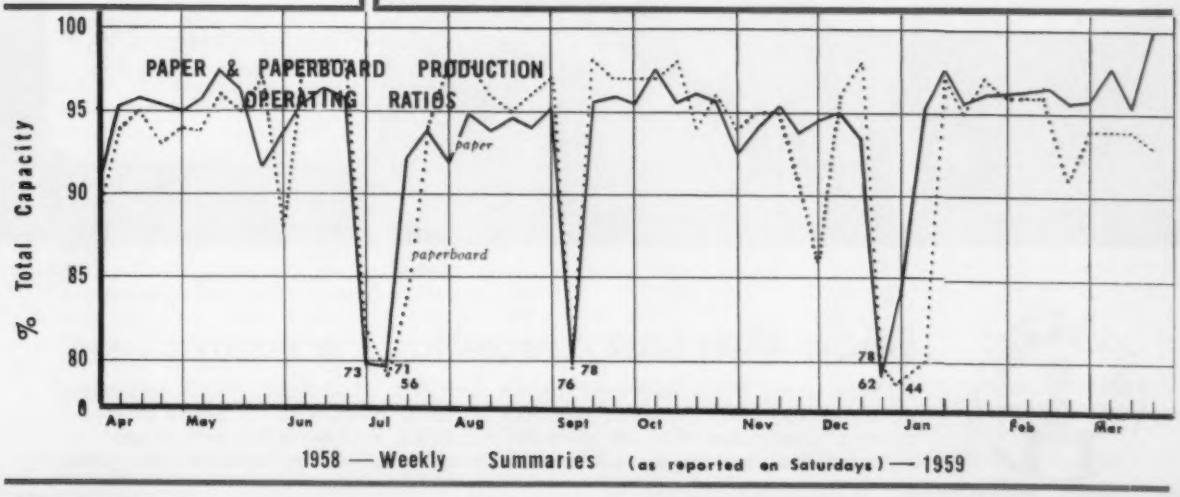
Canadian woodpulp production was sharply ahead in the first two months this year against the same period in 1959, owing to a strong rise in newsprint output and a modest gain in pulp exports. Output in February was up 12.5% from last year. February pulp exports were ahead 8% as compared with 1959.

Small Gains for Canadian Board

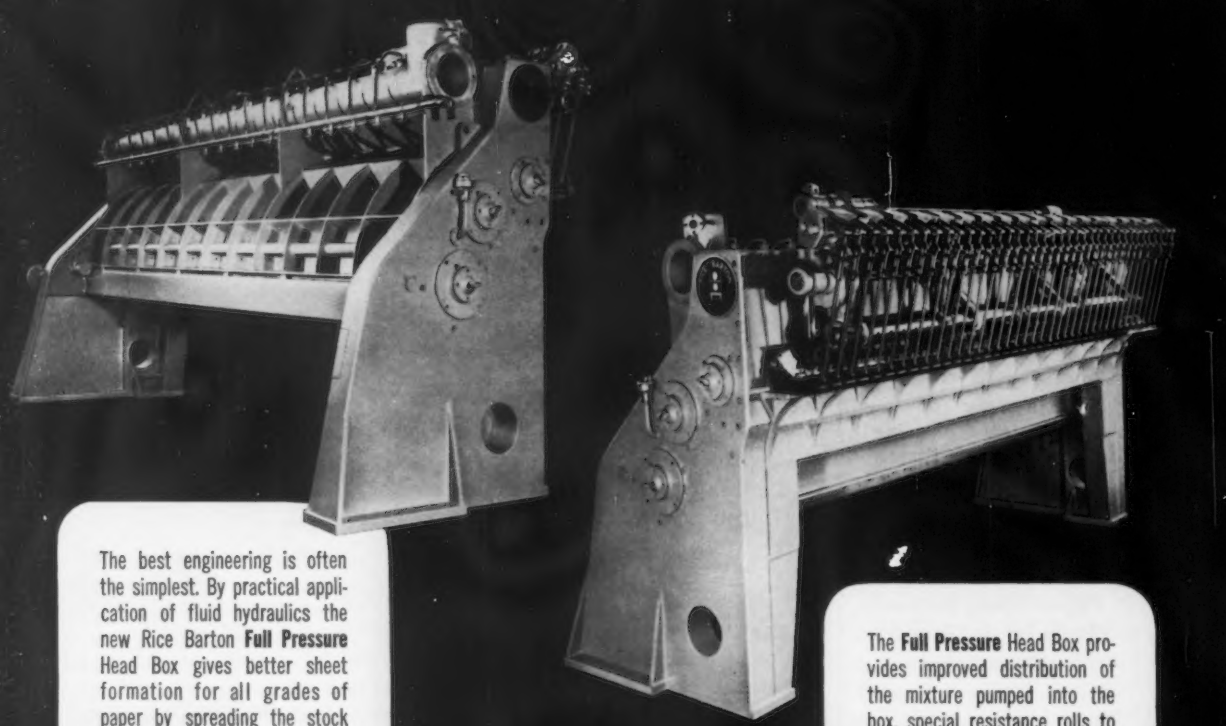
Canadian paperboard production gained slightly in February despite small decreases in domestic shipments and exports. Production in February was 3% higher than same period in 1959. Output to the end of February was 2% from a year ago.

Paper Trade Journal Adopts the Step-Child

Finishing, it is said, is one of the most expensive and least studied aspects of paper mill production. Paper Trade Journal's "Operation Finishing" will try to do something about this. A comprehensive program of articles, surveys, and research is planned. This present issue contains an article which represents one of our early steps in this project.



Better Sheet Formation for all grades of paper with Rice Barton's **Full Pressure** Head Box



The best engineering is often the simplest. By practical application of fluid hydraulics the new Rice Barton **Full Pressure** Head Box gives better sheet formation for all grades of paper by spreading the stock evenly from the header through the box onto the wire.

The **Full Pressure** Head Box provides improved distribution of the mixture pumped into the box, special resistance rolls to even the flow inside the box and a nozzle adjustment that floats the stock onto the wire the full width of the machine—smoothly, thoroughly mixed, without streaks or boiling. Write for more details.

RICE BARTON

Rice Barton CORPORATION • WORCESTER, MASS.

FOURDRINIERS, PRESS SECTIONS, DRYER SECTIONS, CALENDERS, REELS, WINDERS, HEAD BOXES, SIZE PRESSES, BREAKER STACKS, DIFFERENTIAL DRAW CONTROL DRIVES AND CONE PULLEY DRIVES, PULPING EQUIPMENT, HIGH VELOCITY AIR DRYERS, TRAILING BLADE COATERS, FIBRE-FLASH DRYING SYSTEMS

PJT PAPER TRADE JOURNAL

WEEK OF APRIL 11, 1960

Pierce New President of Brown Co.

Leonard A. Pierce, Jr., vice president-operations of the Penobscot Chemical Fibre Co. of Old Town, Me., has been elected president of Brown Co. Mr. Pierce will assume his new office after the April 18 Annual Meeting of stockholders.

The announcement stated Mr. Pierce's election was the unanimous action of those voting at a meeting of the present Brown Co. board of directors held on April 1, and that the action had the approval of the new nominees for the new board of directors to be elected at the Annual Meeting.

Mr. Pierce, a native of Houlton, Me., is 43 years old. A graduate of Bowdoin College in the Class of 1938, he has been associated with the paper industry since 1940, except for a period of five years when he entered the army.

His first association with the paper industry was in 1936 when he worked in the woods during summer vacation. On return from his service in World War II he returned to the Seaboard Paper Co. at Bucksport, Me. (now St. Regis Paper Co.). After serving a year as foreman of the sulphite plant screen room, he became assistant sulphite superintendent of the bleach plant at St. Regis. Subsequently he was manufacturing representative with the St. Regis sales department in New York City; assistant to the paper mill superintendent; mill manager of the kraft pulp mill at Howland, Me.; mill manager of the paper mill at Kalamazoo, Mich.; and assistant to the vice president-manufacturing, of St. Regis.

L. A. Pierce, Jr.

In 1956 Mr. Pierce was named assistant to the president of Penobscot Chemical Fibre Co. and a year later became vice president-operations.

New Florida Mill of U.S. Gypsum Features Black-Clawson Equipment

The U. S. Gypsum Co. has awarded a manufacturing contract to The Black-Clawson Co. for all of the major production equipment in the new paper mill U.S. Gypsum is building in Jacksonville, Fla. The mill will produce a range of paper grades for the company's entire line of gypsum board products.

The principal piece of equipment will be a 156-inch wide, 9-cylinder paperboard machine for producing 150 tons per 24 hours. It will be equipped with a suction return drum press, four primary presses, plain first main press, and suction second main press. Following the double-decked dryer section will be twin calender stacks, an Autoflyte reel and Rollflyte slitter-winder.

The Shartle Division is constructing the equipment for the three stock preparation systems, which will deliver the filler, back liner, and top liner stock required by the paperboard machine. The three systems employ Hydrapulpers, Liquid Cyclones, Sutherland breaker traps, Brammer consistency regulators, jordans and thickeners, Selectifier screens, and Black-Clawson pumps and valves. U.S. Gypsum plans to complete the mill and begin operations early in 1961.

St. Regis-Central Stock Exchange Plan Filed

St. Regis Paper Co. has filed with the Securities and Exchange Commission a registration statement relative to the issuance of St. Regis common stock to be offered in exchange for the outstanding shares of the capital stock of Central Waxed Paper Co. of Chicago, Ill.

The proposed offer would provide that if the exchange is declared effective, a maximum of 112,875 shares of St. Regis common stock would be issued on the basis of eight thousand two hundred nine ten thousandths (.8209) of one share of St. Regis common stock for each share of capital stock of Central.

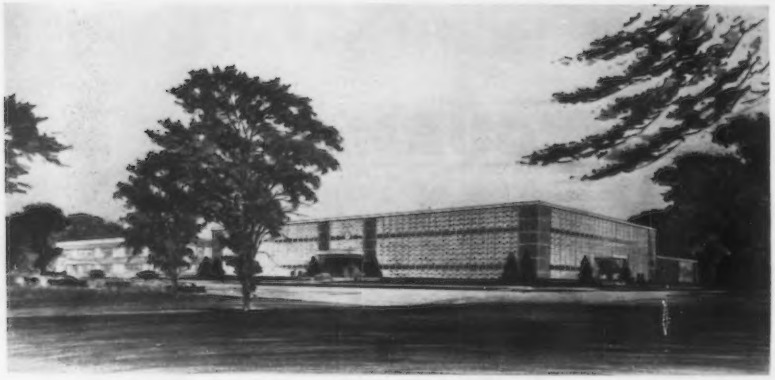
Central Waxed Paper Co. is principally a converter of various types of flexible packaging papers for a number of different industries. Central prints, waxes, and treats various grades of glassine, sulphite, bleached kraft, natural krafts, board, foil, cellophane and other films. The company also laminates various types of paper such as sulphite, glassines, and cellophane and produces special papers with pressure seal coating. The majority of the papers manufactured and converted are sold to the food industry. Other waxed and unwaxed protective papers are produced for use by manufacturers of confections, pharmaceuticals, soap and tobacco products.

Central has approximately 225 employees. The company had sales of $9,207,503 in 1959.

Southland to Make Newsprint for St. Regis Paper Co.

St. Regis Paper Co. announces that it has made an agreement with Southland Paper Mills of Lufkin, Texas, for the manufacture of kraft paper on one of Southland's four newsprint machines. The output of kraft paper will be available to St. Regis and Perkins-Goodwin Co.

Southland is now in the process of installing the necessary equipment for converting the paper machine for the manufacture of kraft paper.



Nekoosa-Edwards Plans New Office Building

Plans for construction of a new general administration building in Port Edwards, Wis., have been approved by the board of directors of Nekoosa-Edwards Paper Co. The new structure will aid in providing improved service to customers through greatly enlarged facilities designed for increased efficiency of all general office activities.

The building will be two stories with a full basement containing approximately 75,000 square feet of floor space. It will be erected on the site of the present Paper Inn restaurant and will connect with a closed passage-way to the mill office building.

The first floor will be occupied by general accounting, data processing and industrial relations departments. Sales, advertising and traffic departments, executive offices, conference rooms and an employes' lounge will occupy the second floor.

The present main office building, in use since 1872, will be razed and the area will be used as a parking lot.

Scott to Modernize Woodhandling At Winslow Mill

An expenditure of $2,744,000 has been authorized for modification of the woodhandling and preparation at the Winslow plant of Scott Paper Co. This action by Scott's board of directors paves the way for a new approach to the wood storage and handling techniques that have been used in Winslow for many years. The Winslow plant has an unusual wood handling system, based on a flume for conveying logs from the barkers to the chippers. In addition it is necessary to store huge quantities of peeled logs for winter use.

Under the new system the softwood chips will be blown to a nearby area, stored in an uncovered pile and reclaimed mechanically as needed. Hardwood will be handled separately in the same manner.

An additional number of essential improvements are contemplated. They include rebuilding the overhead chip bins in the pulp mill, a new bridge across the canal at the north end of the mill property, new unloading and transport conveyors, three new dump bodies for trucks and the enlargement of the present peeled wood area.

Finally, modifying one of the existing boilers will permit the burning of bark.

Scotts Extensible Paper Now Available

An extensible kraft paper with "two-way stretch" that reduces breakage of multiwall bags and other paper products used for heavy duty packaging was introduced by the Hollingsworth & Whitney Division of Scott Paper Co. at the American Management Ass'n. National Packaging Exposition.

In developing the new paper called "Expanda-Kraft," a primary objective was to balance two major factors: One, the need for stretchability and toughness to prevent bag breakage in packaging, shipping, and storing many types of commodities; two, the need for optimum rigidity, flexibility, uniformity, printability, moisture resistance, and other factors that simplify production and handling problems of bag manufacturers and users. Although the principal use of the paper currently is for multiwall bags, it is expected to be adopted for shopping bags, magazine and catalog wrappers, and similar packaging applications that require superior strength with good flexibility.

Expanda-Kraft costs slightly more per pound than ordinary kraft paper but because of superior toughness it permits the use of lighter basis weights resulting in production and handling economies.

A key consideration in developing the paper was to determine how much stretch it should have, both in machine direction—lengthwise in the paper machine—and in cross direction.

Scott's new "roll crepe" process, for example, could impart as much as 30 per cent extensibility to paper. Research found however, that paper with too much stretch does not have other properties essential to efficient bag production. As a result, Expanda-Kraft is being produced with approximately one and one-half times more cross-direction and five times more machine-direction stretch than ordinary kraft. These percentages are considered to be the optimum to permit the walls of bags to "give" without breaking and to resist puncturing and cracking under strain or impact.

Paper and Paper Board Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending March 26, 1960, at 99.9 per cent compared with 98.1 per cent, revised for the preceding week. The ratio was 92.9 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the week ending March 26, 1960, at 93 per cent, compared with 94 per cent for the preceding week and 95 per cent for the corresponding week a year ago.

(Detailed statistics on page 74)

PJT ASSOCIATION NEWS

New Horizons for Printing and Paper

An "imagineering" contest to unearth new or obscure uses of printing and paper was launched by The National Paper Trade Ass'n. during its 57th annual convention.

The contest, which will run from April 1 to July 31, 1960, will be open to all N.P.T.A. merchant members and their staffs. Participants are to submit unique or unusual samples of current printing or ideas which could be adapted by the graphic arts industry and promoted on a national basis.

Prizes for the four months contest will include a first prize of $1,000; a second prize of $500, and a third prize of $250. In addition to the cash awards, ten entrants—including the top three winners—will receive suitable trophies in recognition for their entries. Where printed samples are among the winning entries, the producers of the samples submitted will receive duplicate trophies.

Entries will be judged for (a) uniqueness of the idea or sample, (b) rarity of present usage or originality of the idea and (c) adaptability for promotion nationally.

TAPPI Pulp Bleaching Conference Announced

The Pulp Bleaching Conference, sponsored by the Pulp Purification Committee of TAPPI, will be held June 14 through 16, at the Edgewater Beach Hotel, Chicago.

The Pulp Bleaching Conference offers six technical sessions, 16 technical papers, a technical panel and discussion sessions.

The conference includes papers devoted to theoretical aspects as well as those having immediate practical significance. The authors and moderators will be recognized as outstanding international experts in the field of pulp bleaching.

Assisting R. J. Auchter, program chairman, in developing the technical program were: J. F. Whalen, Combined Locks Paper Co., Combined Locks, Wis.; and J. D. Wethern, Riegel Paper Corp., Acme, N. C.

Ferdinand Kraft, Marathon Division of American Can Co., Menasha, Wis., is general chairman, and Herbert O. Teeple of TAPPI is in charge of the general arrangements for this conference.

Hotel reservations may be secured by contacting the following address: TAPPI Pulp Bleaching Conference, Edgewater Beach Hotel, Chicago 40, Ill. The hotel will confirm reservations directly to individuals.

The program follows:

TUESDAY, JUNE 14

Session I. Moderator: F. Kraft.

"Theory of Optical Properties of Pulp" by J. A. Van den Akker, Institute of Paper Chemistry.

"Optical Properties of Highly Bleached Pulps" by J. H. E. Herbst, Industrial Cellulose Research Ltd.

Session II. Moderator: R. J. Stevens, Canadian International Paper Co.

"Chlorination of Wood Pulp" by C. Dence, State University College of Forestry, Syracuse University.

"Alkaline Extraction of Wood Pulp" by M. Wayman, Sandwell International Ltd.

"Hypochlorite Bleaching" by J. M. McEwen, Weyerhaeuser Timber Co.

WEDNESDAY, JUNE 15

Session III. Moderator: F. Casciani, P. H. Glatfelter Co.

"Peroxide Bleaching of Kraft Pulps" by N. Hartler, Central Laboratory of Swedish Cellulose Industry.

"Status and New Developments in Peroxide Bleaching of Pulps" by F. L. Fennell, E. I. du Pont de Nemours and Co.

"Laboratory Studies on Bleaching New Zealand Pinus Radiata Kraft Pulp" by G. A. Nicholls, New Zealand Forest Products Ltd.

Session IV. Moderator: F. P. Doane, Bergstrom Paper Co.

"Studies on the Mechanism of Chlorine Dioxide Bleaching" by K. V. Sarkanen, State University, College of Forestry, Syracuse University.

"Chlorine Dioxide Bleaching" by W. H. Rapson, University of Toronto.

"Some Aspects on the Bleaching of High Yield Chemical Pulps" by H. W. Giertz, Technical University of Norway.

THURSDAY, JUNE 16

Session V. Moderator: H. W. Bailkowsky, Weyerhaeuser Timber Co.

"Materials of Construction for Modern Bleaching Systems" by R. L. Allen, Jr., Eastern Engineering Co.

"Use of Reducing Agents" by J. L. Keays, MacMillen, Bloedel and Powell River, Ltd.

"Effect of Bleaching on Papermaking Properties" by M. H. Voelker, Institute of Paper Chemistry.

"Effects of Additives and Treatments on Bleached Pulps" by R. H. Boehm, Kimberly Clark Corp.

PIMA Announces Convention Theme

"'The Paper Industry—In Orbit for the Sixties,' is the theme of the 41st Annual Convention of Paper Industry Management Ass'n.," said A. C. McCorry, president. The association will meet at the St. Francis Hotel, San Francisco, Calif., on June 7, 8, and 9.

Plans for mill visits will include opportunities to see production techniques in seven different mills in the Antioch, Emeryville, and Santa Clara areas.

NPTA Re-Elects Present Officers

The membership of The National Paper Trade Ass'n., Inc., re-elected its present officers to serve another term of office until March, 1961.

The officers are: Floyd H. Blackman, president, who is vice president of Stone & Forsyth Co., Boston, Mass.; William F. Obear, vice president for fine papers, president of Tobey Fine Papers, Inc., St. Louis, Mo.; Gardiner Young, vice president for wrapping papers, president, Bancroft Paper Co., Monroe, La., and Charles E. Canfield, treasurer, who is president of The Canfield Paper Co., New York City.

Members of the N.P.T.A. executive committee include the four officers and the following members: Robert McCormick, Oklahoma Paper Co., Oklahoma City, Okla.; Lawrence A. Platt, The Alling & Cory Co., Rochester, N. Y.; Ralph Schnitzer, Sr., Magnolia Paper Co., Houston, Tex.; Hamilton Vose, Jr., Berkshire Papers, Inc., Chicago, Ill., and R. R. Whiteman, Blake, Moffitt & Towne, San Francisco, Calif.

O. Glenn Leach is executive secretary of the N.P.T.A.

PAPER PEOPLE

O. H. Messecar

Fraser Appoints Eastern Manager, Converter Sales

Fraser Paper, Ltd.'s, New York general sales office has announced the appointment of O. H. Messecar as eastern manager, converter sales.

Mr. Messecar has been with Fraser Paper since 1934, when he assumed duties at the company's Madawaska, Me., mills. Increasing responsibilities since that time have brought him through testing, service engineering and sales departments. He transferred to the New York office in 1954, acquiring sales duties throughout southeastern and some northeastern territories.

Houston Paper Co. Names Production Chief

Ralph Krieger has been named production superintendent of the folding carton division of the Houston Paper Co.

Mr. Krieger was with the Burd & Fletcher Box Co. in Kansas City and the Sutherland Paper Co. in Kalamazoo, Mich., prior to joining Houston Paper.

AIP Elects Willets To Governing Board

William R. Willets, assistant manager, Technical Service Laboratories, in charge of Paper Section, Titanium Pigment Corp., has recently been elected to the Governing Board of the American Institute of Physics. Mr. Willets is secretary-treasurer of the American Society of Rheology.

Southland Paper Creates New Post; Elects Officers

E. L. Kurth has moved from president to the new post of chairman of the board of the Southland Paper Mills, Inc.

R. W. Wortham Jr., advanced from executive vice president to the presidency of the newsprint company.

Directors reelected George L. Clarke vice president in charge of operations, Ottis Locke, vice president, and Karl W. Cooke, secretary-treasurer.

Mr. Kurth had been president and chief executive officer since the firm was formed in 1939. Mr. Wortham, a director since the mills were founded, became executive vice president in 1944.

Weyerhaeuser Official Resigns to Take New Post

W. P. Gullander, Weyerhaeuser Co. vice president, finance, will resign March 31 to become executive vice president of General Dynamics Corp. in New York.

Mr. Gullander joined Weyerhaeuser's Tacoma headquarters staff in 1952. Earlier, he was associated with the General Electric Co. for 22 years in various management capacities. He has served as president of Columbia and Cowlitz Railway Co. and Weyerhaeuser Foundation and as vice president of Chehalis Western Railroad Co.

Elder Named Chief Chemist at Everett Mill

John M. Elder has been named chief chemist at Weyerhaeuser Co.'s kraft pulp mill in Everett, Wash. Mr. Elder, who has been a project chemist since the kraft mill began operation in 1953, joined Weyerhaeuser in 1952 as shift chemist at the Everett sulphite mill.

A chemical engineering graduate of the University of Idaho, Mr. Elder took graduate work at the University of California. Prior to associating with Weyerhaeuser, he worked as project chemical engineer at the Lewiston pulp mill of Potlatch Forests, at Rayonier's Hoquiam mill, St. Regis Pulp Co. in Tacoma, and at Hooker Electrochemical Co.

Peterson To Head New Department at Bergstrom

Richard C. Peterson, safety paper division manager, has been named to head the newly formed research and development department of Bergstrom Paper Co., Neenah, Wis.

Mr. Peterson joined the company in 1954 as technical director. He became assistant mill superintendent the following year. In 1957, he was appointed manager of the safety paper division at the Waupaca location, returning to Neenah in that position when the safety paper plant was completed there.

AFP Names Sutlive Public Relations Director

W. Kirk Sutlive, director of public relations for the Union Bag-Camp Paper Corp., in Savannah, has been named 1960 chairman of the nationwide public relations consultant committee of American Forest Products Industries.

Public relations directors from all phases of the wood-dependent industries are members of the committee,

Scholarship Available

A scholarship in the amount of $750 is offered by PAPER TRADE JOURNAL to a student who wishes to enter the University of Maine to major in pulp and paper technology. This is a continuing grant available in the freshman and sophomore years. The main purpose of the scholarship is to enable a student to major in pulp and paper at the University of Maine who might not otherwise be able to do so. Therefore the financial need of the student will have an important bearing on the choice of the recipient, who will be selected by the Freshman Scholarship Committee of the University of Maine.

Application forms for the PAPER TRADE JOURNAL scholarship should be requested from the Director of Admission, University of Maine, Orono, Me. Early application is advisable.

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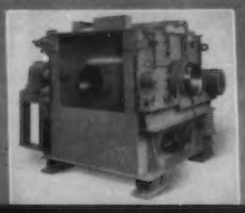

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whose function is to steer AFPI's national forestry educational program, John H. Hinman, president, said. The American Tree Farm system is a part of this program.

Weyerhaeuser Announces Management Changes

Weyerhaeuser Co. has announced recent changes in management personnel of its shipping container and milk carton divisions.

Kenneth Cook replaces John A. Conboy as plant manager of the company's milk carton branch at Harmony, Pa. Mr. Conboy moves to the Camden, N. J., branch.

Walter B. Duggan was named resident manager of the Baltimore, Md., shipping container branch. He has been sales manager at this branch since 1952.

John C. O'Brien becomes manager of Weyerhaeuser's milk carton branch in Whittier, Calif. He was formerly office manager of the Carpentersville, Ill., branch.

Robert B. LeRoy assumes new duties at Camden as administrative assistant of the shipping container division's Eastern region.

5 PROFIT MAKERS for the MODERN PAPER MILL

Ross Midwest Fulton Dryer Drainage Systems

Pays for itself in steam savings alone. Also increases production from 10% to 30% and improves quality of the sheet.

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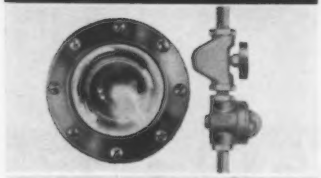
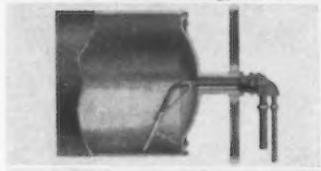
A proven condensate removal device for rotating dryers. Condensate film is reduced to a minimum, higher heat transfer, lower evacuation differentials, lower steam consumption.



Ross Midwest Ball Sight-Flow Indicators

Self-cleaning, front and side visibility, may be installed either vertically or horizontally, you know what's going on inside the dryer.



Ross Midwest Auto-Flex Syphon

The most dependable syphon, fits any syphon type dryer, always maintains proper clearance, no adjustments, minimum maintenance.

Hydroscillators for Rewinders

Eliminates wrinkles and hard and soft spots on the roll. Here's the key to less loss at the finished end.

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We are preparing a list of persons who are serving the pulp and paper industry as consultants. If you are in this category, will you send us a note with your name and address and the field in which you specialize or are particularly qualified? We are anxious that our list be as complete as possible.

Ciampolillo Promoted to Keyes N. Y. Sales Staff

Appointment of Gerald J. Ciampolillo to the New York sales office of Keyes Fibre Co., Waterville, Me., has been announced.

Mr. Ciampolillo, who has been with Keyes for five years, has been working out of Syracuse, N.Y., as a Keyes sales representative in the northwestern Pennsylvania and northern and western sections of New York State.

OBITUARIES

Harold Stowell Lord, 72, of Arlington, Mass., retired executive of the former Hollingsworth & Whitney Co., of Boston, died March 8 at New England Baptist Hospital.

Mr. Lord was graduated from the Massachusetts Institute of Technology in 1911. He served in both world wars.

Peter G. Thomson Jr., 81, a son of the founder of Champion Fibre Co. died unexpectedly March 23 in his summer home at Asheville, N. C. He was a resident of Coral Gables, Fla.

Charles William Howarth, president of Columbia Box Board Mills, Inc., Chatham, N. Y., died March 26. Mr. Howarth, who had been actively engaged in the paperboard industry for over 45 years, was elected president of Columbia in 1943.

PAPER TRADE JOURNAL is always mailed on Friday and should be received in most parts of the country early in the week. If there seems to be undue delay in receiving your copy, we suggest that you write to your local postmaster, with a copy to the postmaster at East Stroudsburg, Pa., where we mail and a copy to us.

PJT NEW LITERATURE

Natural Gas Engines

Traces the development of the natural gas engine; shows model views, specifications and fuel consumption curves of current models; and explains why these engines offer the lowest cost per horsepower in the industry. Booklet 20173. Caterpillar Tractor Co., Engine Div., Peoria, Ill.

Opportunities for Graduate Studies

Describes the research objectives of the various divisions of Forest Products Laboratory and how a cooperative arrangement with the University of Wisconsin makes it possible for a selected group of students to fit their graduate research into the framework of the Laboratory's program and facilities. Brochure. Obtainable from Dr. E. G. Locke, Director, U.S. Forest Products Laboratory, Madison 5, or University of Wisconsin, Madison 6, Wis.

Radiant Heat Applications

Gives complete information on infrared heating, its principles, advantages, applications, and typical standard systems-20p Bulletin. Fostoria Corp., Infrared Div., Dept. 49, Fostoria, Ohio.

Sure-Flex Couplings

Covers complete line of flexible couplings. Also gives new engineering data on spacer couplings with drop-center sleeves, and on the use of Sure-Flex couplings with a floating shaft to connect two shafts that cannot be brought close enough together to be connected by a single coupling. Bulletin 5103. T. B. Wood's Sons Co., Chambersburg, Pa.

The Evolution of Condensate Drainage

This paper is on the solution of the problem of obtaining maximum and efficient latent heat transfer from steam to a product. Reprint 126. Cochrane Corp., 17th St. Below Allegheny Ave., Philadelphia 32, Pa.

Indox V Permanent Magnet Pulleys

Furnishes useful data and specifications on the complete line of pulleys. Also explains how Indox V, highly oriented barium ferrite ceramic magnet material, provides pulley performance equal to the most powerful electromagnetic types. Bulletin 1022. Stearns Magnetic Products, 635 S. 28th St., Milwaukee 46, Wis.

Gauges and Instruments

Provides a quick roundup of U. S. Gauge products, to simplify the engineer's job of choosing the right gauge or instrument. Bulletin 3015. U. S. Gauge Div., American Machine & Metals, Inc., Sellersville, Pa.

New Silicon Rectifier Conversion Units

Gives detailed information on product features, applications, cost savings and reduced maintenance. It includes photographs, line and dimensional drawings, ratings and application tables. Bulletin GEA-7060. General Electric Co., Schenectady 5, N. Y.

Dings Magnetic Pulleys

Explains factors governing the selection of electromagnetic pulleys or non-electric ceramic type Perma-Pulleys. Catalog C-2000. Dings Magnetic Separator Co., 4740 West Electric Ave., Milwaukee 46, Wis.

Du Pont's Exclusive Service

Highlights the service available to you and how it can help improve your paper and paperboard with "Elvanol" polyvinyl alcohol and "Elvacet" polyvinyl acetate emulsion. Contact the nearest Electrochemicals Dept. district office and find out how. Brochure. E. I. du Pont de Nemours & Co., Wilmington 98, Del.

Dynapar Digital Rotopulsers

Describes use of transistorized digital preset counters, process controllers, and Rotopulsers and other sensing devices which are used to provide precise numerical readout and actuation of automatic control function in nine industrial applications. Data Sheets. Dynapar Corp., 7312 Ridgeway Ave., Skokie, Ill.

Kofilm Starches

Shows both technical and non-technical personnel how to apply Kofilm starches to their papermaking operations. Also provides numerous charts and graphs illustrating the physical properties of Kofilms under various conditions of use. Manual. Paper Div., National Starch & Chemical Corp., 750 3rd Ave., New York, N. Y.

Fabricated Silicone Rubber

Helps the engineer to select and specify the correct silicone rubber part to meet typical application problems. Also describes Haveg's know-how to formulate special purpose compounds to meet specific requirements. Manual. Haveg Industries, Inc., Taunton Div., 336 Weir St., Taunton, Mass.

Testing Instruments for Sheet Stock

Illustrates and describes instruments designed for testing or comparing the various physical and mechanical properties of papers, tissues, films, foils, boards, and other sheet materials requiring accurate measurement, weight, and strength data. Brochure. E. J. Cady & Co., 630 N. Harlem Ave., River Forest, Ill.

Bauer Digesters

Describes digesters and related equipment to meet all pulp cooking requirements. Also includes information on the Bauer-Grenco rotary valve and installation photos, schematic drawings, operating data, capacity and advantages of each unit. Bulletin P-30. Bauer Bros. Co., Springfield, Ohio.

Bakelite Brand Fibrous Resins

Discusses the economical incorporation of these materials in paper with conventional equipment. Possible uses include laminating, pulp and paper moulding, and bonding of asbestos and glass fiber mats. Technical release. Union Carbide Plastics Co., 30 E. 42nd St., New York 17, N. Y.

Town of Dryden Likes Kraft Odor

The town of Dryden, Ont., is celebrating its Fiftieth anniversary. As a mascot it has chosen a skunk named "Prosperity." The local newspaper "The Dryden Observer" states ". . . we decided it was time we admitted to all and sundry that we are proud to have that valuable aroma that emanates from our biggest and most valuable bread earner, the Dryden Paper Co."

We have often heard people in kraft mill towns say "It smells like bread and butter to us" but we are intrigued by this new approach.

The prosperity of Paper Trade Journal being tied to the pulp and paper industry, the editors agree with the bread and butter metaphor and would even add a touch of jam. In fact the editor having been brought up in a kraft mill likes the smell because it brings back nostalgic memories.

Surge Area Requirements Are a Vital Factor in Finishing Room Layout

Efficient finishing demands that there be adequate storage areas between each operation. Determination of requirements for each surge area are discussed in detail.

This article describes the design principles which have been applied to facilitate flow of paper in process including the vital surge area requirements between each operation. It emphasizes the necessity for surge areas, because experience with integration of such operations as fan sorting connected by conveyor with trimmers has proven difficult to balance on a continuous basis. It also stresses the absolute relationship between scheduling policy, run size, and surge areas.

Hypothetical Finishing Department Details

Again, let us repeat the description of the hypothetical finishing department upon which these articles are based. The average daily production is 300 tons of which 210 tons are in sheets and 90 tons in shipping rolls.

The sheets are divided into 70 tons of junior size and 140 tons of parent size. The rolls are divided into five tons of counter roll size and 85 tons of converting size (15 tons of which are off-machine slit). There are secondary and tertiary finishing operations, supercalendering, embossing, drilling and round cornering totalling an average of 20 tons per day. Of the sheets, 17 tons per day are packed on skids.

Three Shifts Important

To obtain the maximum utilization of equipment and space, the first recommendation made is to obtain three shift operation of the sheet finishing operations. Of course, this does not apply to every operation because some standard equipment has enough capacity in one shift to cope with three shifts of the production of the preceding equipment. There is another advantage to the operation of sheet cutters on three shifts. This advantage is due to the fact that many of the paper machine defects are discovered at the cutters and a closer liaison is obtained between the cutter inspector and the paper machine hand responsible. It appears that the liaison between fan sorters who find cutter defects and cutter operators is also improved when the former are also on the job around the clock. But, basically, the surge area required between each operation will be reduced by three shift operation. Otherwise, when an operation is limited to one shift which follows one operating on three shifts, the surge area must be increased by the area occupied by two shifts' production.

"The first recommendation made is that in order to obtain maximum utilization of equipment and space, sheet finishing operations must be carried out on a three shift basis."

To obtain the lowest handling cost, the layout must be designed to obtain unidirectional flow of both paper in process and finishing supplies.

A schematic line flow drawing is shown to demonstrate an optimum plan.

The principles governing layout will be discussed in sequence of a unidirectional flow dealing with sheet operations first. The recommendations will deal with the factors which affect the capacity of floor space requirements for each area. While floor space required for various operations is given for the sample mill, the emphasis will be given to the larger surge area requirements.

Parent Roll Storage Requirements

The first surge area is the parent roll storage. It should be a common storage for sheet and shipping roll operations to facilitate the use of one

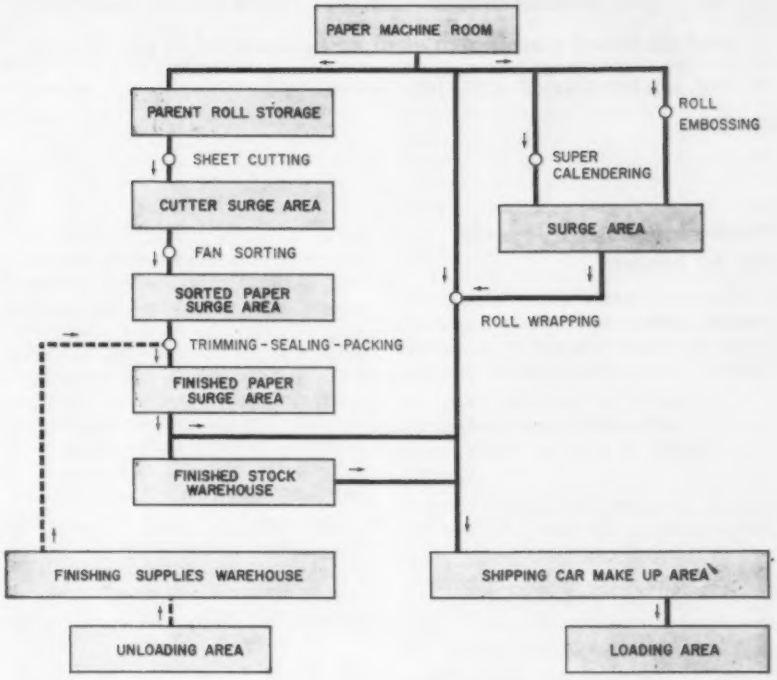
type of equipment and roll handling crew. Its capacity should, therefore, be such that it will accommodate the total requirements for sheet operations and for roll finishing operations. This, for our mill, should fit sheet operations of 210 tons per day and roll operations of 90 tons per day. However, four types of rolls make up the 90 tons per day, namely machine slit rolls, parent rolls for slitting only, embossing only, and for supercalendering and slitting on sheeting. Therefore, one must provide for the storage of sufficient tonnage of parent rolls for roll finishing to accommodate the maximum buildup which will occur when the paper machine run is complete to keep the finishing operations supplied until the next paper machine run of that grade category.

Machine slit rolls, which are moved directly to the wrapping and weighing area, of course, are not considered in this calculation. In the sample mill, if 20 tons per day are slit and the counter roll grades are run every week, the capacity required is 140 tons. If the secondary finishing operations of embossing and supercalendering are of equal demand, it is not essential to provide an additional capacity of 140 tons because the paper making schedule can stagger the delivery and utilize the same floor space for supplying all three operations. It is, however, desirable to keep the grades separate and a specified place for each. Hence, it is recommended to increase the capacity by 140 tons. This also simplifies paper machine scheduling.

Next, we have to provide for the sheet roll storage. Two calculations are required, the first for fast moving items and the second for slow moving items for which a sheet cutter load of rolls is made (unless not withdrawn since previous run) whenever the grade is run on the paper machine. The tonnage capacity required for fast moving items should at least equal one day's production but it is recommended that a study of paper machine schedules be made to ensure that for days when production is predominately shipping roll grades, sufficient storage of sheet rolls can be accommodated to provide for continuity of sheet finishing operations. For instance, if in our mill, there are whole weeks when customer shipping roll demands for the week amount to 150 tons per day, it is obvious that for seven days, the sheet roll production would be reduced to 150 tons per day. This would leave a deficiency of production for sheet finishing operations (capacity 210 tons per day) of 60 tons per day for seven days. To meet this situation, the sheet roll tonnage required in addition to the normal would be 420 tons.

The capacity required for the slow moving items of sheet rolls if three rolls, each weighing 1 ton were provided for, each of six colors of three basis weights of three grades would be 162 tons. So, for our sample mill, under these conditions the total capacity required is 862 tons.

The surge area to provide for the accumulation of secondary finished rolls so that wrapping can be carried out by order sequence will depend upon the size of the orders. However, as this segregation of orders is not necessary if they exceed five tons each, it seems that this area can be calculated as five tons for each secondary slit wrapping equipment and floor space is provided for rolls to be processed at the rate delivered from the paper machine. Otherwise, the surge area must be large enough to accommodate the buildup which occurs whenever paper machine production is scheduled at greater than the wrapping capacity. In the example mentioned above, if the capacity is overloaded for seven days by 60 tons, this would amount to 420 tons. I would never recommend a surge area of this size, however, because it is more practical to add to the wrapping crew and process the extra 60 tons per day.



"Parent roll storage space should be a common area for both sheeting and shipping roll operations to facilitate use of one type of equipment and roll handling crew."

"Sorted paper surge area depends upon continuity of operation. That is, how many shifts are operated by the fan sorters and trimmers. Also are small runs accumulated?"

"It is preferable that the surge area between finishing and finished paper warehouse be located in the finishing department as this saves rehandling of stock items."

Cutter Surge Area Depends On Six Factors

The next surge area is that for sheets which have been delivered from the rotary cutters. Six factors affect the capacity required, namely:

1. A policy of 100 per cent fan sorting will reduce this surge area requirement because a second surge area will be required after sorting.

2. If 100 per cent fan sorting is not the policy, the area required will depend upon the number of shifts the trimmers operate, i.e., must accommodate the accumulation of the cutter production for any shifts they operate that are not operated by the trimmers.

3. If the policy followed requires the accumulation of enough paper of one size to keep certain trimmers occupied for a minimum of four hours, this will increase the size of the surge area directly ahead of the trimmers.

4. To provide for longer runs on the paper machine on slow moving colors of each grade, this surge area should be large enough to hold parent size untrimmed sheets from which several sizes may be trimmed.

5. A separate "bond" is recommended for the storage of "hold" sheets. To provide an area, into which all off-standard paper can be placed while awaiting disposal instructions, has two advantages. The first, of course, is to provide floor space to accommodate paper in this category. The more important advantage of a recognized well marked "bond" is the psychological effect that the presence of paper in the area for long periods of time has upon those who are responsible for making a decision.

6. There is also a requirement in this surge area or in an area adjacent to it for a defined space into which overruns and saleable off-quality paper are to be placed. In some mills, paper in this category is stored in rolls because there is less trimming waste. However, I prefer to store this category in parent size sheets because it provides for better utilization of floor space and provides a more accurate means of reporting quantities to the production planning department for disposal action.

Fan Sorting Area

For the sample mill where we assume that 100 per cent fan sorting and three shift operation of the main phases is carried out, the following calculations apply. Also, it is assumed that complete orders up to five tons are processed together to eliminate "straggler" loads. It is also necessary to point out that where 100 per cent fan sorting is carried out, there must be an additional surge area between the fan sorting area and the trimmers where accumulation of trimmer runs of the same size can take place.

First, let us calculate how much will normally be in process in the fan sorting area. The 210 tons per day average productive capacity will require that 21 tons will be sorted at one time because the average production of one sorter station per 24 hours is ten tons.

To provide for peak load, it is possible 25 tons will be in process in the fan sorting area. Therefore, from experience, the surge area between the cutters and the fan sorting area should accommodate a minimum of 50 tons to serve the fan sorting operation. However, there are other factors which tend to increase the capacity requirements. Factor (2) does not apply in our sample mill and Factor (3) will be taken care of in the second surge area. However, as mentioned previously, there is a requirement to accommodate six slow moving colors of three grades in three basis weights. Factor (4) when the cutter sheets the three rolls of one color, grade and basis weight, provision must be made in this area to store the parent sheets for which there is no finishing order. Hence, it is estimated that 81 tons capacity should be provided for this paper. Factor (5).

The size of the "bond" for "hold" paper, of course, is arrived at purely by experience. A large area is desirable from the inspector's standpoint because, for instance, sometimes wrinkled and cockles will disappear in time. It is preferable to limit the size of this area to expedite decisions when delay in remaking affects good customer delivery service. For the sample mill, it is suggested that this area be limited to the productive capacity of one shift of the largest paper machine, i.e., 25 tons. Factor (6). The capacity of the overrun and job lot storage area requires one calculation for overruns and experience with job lot production frequency and sales action for same. The overrun capacity should be based on the 300 tons per day mill production and the frequency of turnover. Slow moving items were provided for in Factor (5). Hence, it is estimated that the turnover will be reduced to once per week. Therefore, an estimated average of five per cent overrun requires a capacity of 105 tons. Applying my own experience, the job lot capacity required for our sample mill will be an additional 105 tons. The total capacity of this first sheet surge area for the sample is, therefore, 366 tons.

"The transfer of paper from the finishing area to the shipping warehouse must be done on three shifts to restrict capacity requirements of the surge area at the end of finishing."

"It is generally accepted to provide 20 square feet exclusive of aisles per ton of sheets when they are stored without tiering one load upon another."

Sorted Paper Surge Area

The next surge area required is that located between the fan sorting area and the trimmer, sealer, packer operations. Its size depends upon

TABLE I

NOMINAL FLOOR SPACE REQUIREMENTS FOR FINISHING

7 cutters with their back stands and set make up area	12,600 sq. ft.
Fan sorting area (21 tons capacity)	4,000 "
9 lines of trimmer, sealing and packing operations including Label Room	15,000 "
Secondary roll finishing operations require	15,000 "
Roll wrapping operations require	3,000 "

the number of shifts operated by the fan sorters and the trimmers and the policy of accumulating runs of at least five tons or four hours' production capacity of one size for each of the major lines. For the conversion of off-lines, the area must provide for accumulation of at least one shift's capacity for each line.

In the sample mill, an average of three parent size lines, two junior size lines, one conversion line and one off-line are operated. The five major lines are operated three shifts continuously; the variation in the ratio being taken care of by means of a spare parent size line and a spare junior size line. The other lines operate for full weeks on either one or two shifts depending upon temporary fluctuation in demand. Therefore, the minimum surge area requirements are $5 \times 5 = 25$ tons for the major lines and 16 tons for the other lines. However, experience with the mix of sizes received from the cutters indicates that while one run of five tons of one size is being accumulated, there are at least 20 other sizes coming through.

The other factor which increases the demand on this area is the follow up of straggler parts of individual orders. As many as 60 part orders are in each surge area at one time. Therefore, the total effect is to increase the minimum requirement of 41 tons by 75 tons to the total of 116 tons.

Transfer Area Should be In Finishing

The final surge area is a transfer area between the finishing department and the finished paper warehouse. This is frequently in the warehouse but I prefer that it be located in the finishing department so that the warehouseman can pick up each load and transport it directly to the specified storage area or car loading make up area. This saves rehandling all stock items because whenever there is a loading order for stock items being produced, he can deliver it direct from the finishing department to the car loading make up area. The size of this area depends upon the number of shifts during which the shipping department operates. It is preferable to operate the shipping department on three shifts to expedite loading but this is frequently not economical because of the excessive overhead of supervision, and clerical requirements corresponding to the direct labor. However, the transfer from finishing to the shipping warehouse must be done on three shifts to restrict the capacity requirements for this surge area. This area must provide for both the loads at the end of each line but for the empty pallets upon which the production is to be placed. It is estimated that the capacity or this area should be 70 tons.

Unit Storage Space Varies

The subject of floor space required per tons of capacity should be dealt with at this point. It is generally accepted to provide 20 square feet exclusive of aisles per ton of sheets when they are stored without tiering one load upon another. The sheet surge area requirements listed above all require this unit space. The roll surge area requirements where rolls are placed on end and piled on top of each other, require 54 square feet per ton per foot of height of the average pile exclusive of aisles. In the sample mill, the average height is only six feet although frequently for certain grades, six-foot long rolls of 40 inch diameter are piled three up. However, simultaneously, other areas are empty.

The subject of floor space required for the actual finishing operations is largely a design engineering matter. However, the nominal floor space required for mill is shown in Table I.

Finishing Supply Storage Capacity Required is Large

The finishing supplies storage capacity required is a very important one; also, is the need for it to be located adjacent to both the receiving platform and the packing area. The ream, roll and skid wrappers, pallet, skid, carton, glue supply, each require a separate and distinct area where space can be allocated to each specific item just as will be described in a later article for the finished stock warehouse.

For the sample mill, where the cartons are not printed, the empty carton stock carried is 200,000 of more than 30 sizes, the wrapper stocks are in excess of a car-load of each of 15 roll sizes, 1,500 empty pallets are required of 3 sizes, 200 empty skids of 15 sizes. This requires floor space with 14-foot clearance overhead of 15,000 square feet.

For the hypothetical mill, the summary of floor space requirements is given in Table II.

TABLE II

SUMMARY OF FLOOR SPACE REQUIREMENT

	Tons	Floor Space Exclusive of Aisles
Machine Slit Roll Accummulation		8,400 sq. ft.
Embossers		1,200 "
Supercalenders		1,200 "
Surge Areas for Secondary Finishing	10	180 "
Roll Wrapping Area		3.000 "
Parent Roll Storage	862	8,000 "
Sheet Cutters		12,600 "
Cutter Surge Area	366	7,500 "
Fan Sorting Area		4,000 "
Sorted Paper Surge Area	116	2,320 "
Trim, Seal and Packing Area including Label Room		15,000 "
Finished Sheet Surge Area	70	1,400 "
Finishing Supplies Warehouse		15,000 "
TOTAL	1,424	79,800 "

"What the Fine Paper Manufacturers Are Worrying About"

Quality, manufacturing costs, adequate prices and the need for more volume are stressed by this outstanding leader of our industry.

George Olmsted, Jr.,
President,
S. D. Warren Co.

Let's consider the fine paper mills of this country—what they're thinking and what they're trying to do.

Like a dog with a bone, the mills are "worrying" about four things:

1. Quality of product
2. Cost of manufacture
3. Maintenance of an adequate price level
4. Volume—volume today and in the future

Let's look at each one of the four —briefly—for a moment.

Quality of Product

I can brush over lightly the first one—which is quality of product. You know that for the past 20 years the quality of the industry has gone steadily up and up and up—sometimes with minor improvements — sometimes with giant strides. More and more brightness, more and more opacity. Better printing surfaces. Better printed results, Better meeting of tough requirements—such as offset lithography and now web offset. Greater all around usefulness and better performance of our products in spite of higher press speeds, larger sheet sizes, lighter weights, and the like.

From an address during N.P.T.A.'s Fine Paper Division Meeting, Tuesday, March 29, 1960.

The Author

It has truly been a splendid accomplishment of providing better and better products for continuously more exacting requirements—and the end is not yet, for at long last our industry has become research minded and the many laboratories which were inaugurated after the war will commence to gush their discoveries and improvements over the decade ahead of us. And, believe me, exciting and important developments are in the works today — developments which will accelerate this constant upward push in quality and usefulness of our products.

Cost of Manufacture

Not so exciting—but just as essential—is the second of our four points —cost of manufacture. In spite of inflation, it is our job to hold costs in line as best we can—so that we may steadily provide better values for your customers and ours. The possibilities are limited—we can cut only in materials, in waste, and in people. And, of course, all three of these avenues are being attacked vigorously—all the time and by all mills. Raw material costs have been cut by the wider use of hardwoods, by the use of semi-chemical pulp, by the wider use of pigments, by lower cost adhesives.

Waste has been lowered through automation and better controls — which now are involving nuclear energy and the full range of electronics. Control of basis weight by beta ray gauges, better spread of stock on the wire by nuclear controls, detection of holes and slime spots by electronics— all these devices—and expensive devices they are, too—reduce waste and thereby lower costs.

By mechanization on the one hand and better equipment on the other, the productivity of our people is being increased year by year. Again an expensive job—but larger and faster machines, automatic controls, labor-saving devices here and there — all these are steadily pushing down the number of man hours required to make a ton of fine paper.

Whether it be materials, or waste, or productivity of people, the industry is steadily "worrying the bone" of cost reduction — and slowly but steadily making progress.

"Merchants can help plenty in the matter of a proper and adequate price level, by maintaining orderly markets, by getting proper markups on what they sell, by refusing to shade margins."

If we are to expand the market for printing paper we must make our product so exciting and effective that we divert advertising dollars from other media to printed promotion. The mills are trying to do this, of course, with their own promotional material and with their specimen exchanges.

But what N.P.T.A. proposes in its "Imagineering" contest is a national specimen exchange where everyone gets in the act and where you achieve the force and the momentum that always go with a widespread crusade.

You never know where ideas will come from. You may have heard of the experience in the Lockheed plant in California years ago before they broke the sound barrier. Time after time, the greatest aeronautical engineers in the world designed a plane, tried it out in the wind tunnel, and when they reached the speed of sound, the wings tore off.

One day a fellow walked in and said, "Look, if you perforate the wings here and here, they won't fall off." The engineers tried it. Much to their amazement, it worked and the problem was solved.

So they had a dinner—chairman of the board, president, V.I.P.'s and all that—to honor the man that made the suggestion. They asked him how he got the idea. "You don't understand," he said, "for 20 years I've taken care of the men's room in this plant and I've always noticed that the paper never tears where it's perforated".*

If the printers will supply their ideas and examples — if the paper mills will supply their ideas and examples—and if the merchants do likewise—then it seems to me that eventually we can create something that did not exist before—something that will entice advertising dollars away from other media to our backyard.

Maintenance of Adequate Prices

The third thing the mills are worrying about is price—and this is a very important worry. A price level which is reasonable and that always can be justified to our customers—but beyond that a price which is adequate to give fair return on investment and sufficient to provide an incentive for expansion.

Let me give an illustration — in rough figures.

Since 1947—that's 13 years ago—the pulp and paper industry has almost doubled its productive capacity—has more than doubled its dollar sales volume—has spent billions of dollars on plant expansion—and yet its profit margin has been cut almost in half.

Here is another illustration. In my own company in the three and one-half years from the spring of 1957 to the fall of 1960 our wages will have advanced 17 per cent and yet the price for our products will have advanced but six per cent. In that same elapsed time, magazine advertising space rates will have advanced a full 15 per cent per thousand of circulation.

Whether you recognize it or not, our industry today stands at a crossroads on this matter of price level and cost-price relationship. We have two choices.

1. One is to use judgment and leadership and move ourselves in the direction of the steel industry—where their cost-price relationship is such that they can make money when running at 50 or 60 per cent of capacity.

2. The other is to fail to use judgment and leadership and then let ourselves drift down to the level of the textile industry where money can be made only during a war or in the midst of an extraordinary boom.

The merchants cannot help the mills very much on their quality problem—or on their cost reduction problem. But they can help plenty on this matter of a proper and adequate price level—help by maintaining orderly markets, by getting proper markups on what you sell, by refusing to shade margins, and the like.

Merchants only get a proper price level when markets are orderly. Merchants control the markets. Merchants control the impact of price. Merchants have more to do with this matter of price level than perhaps they realize, and their leadership should accept this as a responsibility that—for good or bad—can have a very great influence upon the industry as a whole.

"We should use judgment and leadership and move in the direction of the steel industry—where their cost-price ratio is such that they can make money running at 50 or 60 per cent of capacity."

"If we are to expand the market for printing papers we must make our product so exciting and effective that we divert advertising dollars from other media to printed promotion."

Building Volume

Merchants can help, too, on the mills' fourth worry—which is volume—volume today and volume tomorrow. Here we have the chance for a perfect crossruff.

In printing paper—in all of the so-called "cultural papers"—we have had a slow growth as you know. A growth which went up with population increases — which swung with the tides of economic activity. We have never had the frequent shots in the arm which the coarse paper and packaging boys got when some new use was invented—when some new field was opened up for exploitation. As a result some printing paper mills became restless with our slow and normal growth—and there are many instances where mills which started as printing paper mills have branched off into milk bottles, or corrugated cartons, or paper-based plastics, or into the sanitary field—to achieve a greater growth than would otherwise be the case.

And even my own Company—wedded as we are to merchant distribution — has in a small way, launched off into some non-printing specialties such as reflective insulation paper, casting base for vinyl film, paper lithographic printing plates, and others. All these new departures—whether they be milk bottles, or cartons, or plastics, or specialties—all of them are outside the field of merchant distribution. So this is bad for you.

It would be far better if the basic printing paper market could be expanded more rapidly than heretofore has been the case, for if this were done the mills' natural desire for growth would be satisfied without looking to greener pastures elsewhere, and in addition a large share of the expanded printing paper market would be served through merchant distribution.

* Editors Note: Mr. Olmsted's company doesn't make toilet tissue.

The complexity of a large modern pulp and paper company is shown by this chart of St. Regis Paper Co.'s operations. This is reproduced with special permission from the St. Regis annual report.

ST. REGIS

PRINTING PAPERS

Publication and commercial printing papers.

PULP AND PAPER MILLS

Bucksport, Maine
Deferiet, New York
Harrisville, New York
Sartell, Minnesota

Technical assistance is rendered under contracts with paper manufacturers in France and Germany in connection with on-machine coated printing papers.

KRAFT PAPERS

Bleached and unbleached kraft pulp, paper and board.
Coated and uncoated kraft food board.
Specialty papers.

PULP AND PAPER MILLS

Jacksonville, Florida
Pensacola, Florida
Tacoma, Washington

PAPER MILLS

East Pepperell, Massachusetts
Carthage, New York
Herrings, New York

St. Regis owns 50% interest in North Western Pulp & Power Ltd. which produces bleached sulphate pulp in its mill at Hinton, Alberta, Canada.

St. Regis owns 20% interest in Companhia Industrias Brasileiras Portela which has a paper mill at Jaboatao, Brazil.

St. Regis owns 22% interest in Tennessee River Pulp & Paper Company which is building a kraft pulp and board mill at Counce, Tennessee.

SPECIALTY PAPERS

Glassine and greaseproof papers.
Waxing papers.
Foil mounting papers.
Reproduction papers.

PULP AND PAPER MILL

Rhinelander, Wisconsin

PAPER MILL

Columbus, Ohio

St. Regis owns 50% interest in R-W Paper Company which produces glassine and greaseproof papers in its mill at Longview, Washington.

CONTAINERBOARD

(Other than Kraft)

Folding and set-up boxboard.
Corrugating medium.
Chipboard.
Specialty paperboards.

BOARD MILLS

Coshocton, Ohio
Milwaukee, Wisconsin
Cornell, Wisconsin

St. Regis owns 49% interest in Fome-Cor Coporation which produces Fome-Cor board in plants at Addyston, Ohio and Mt. Wolf, Pennsylvania.

PLASTICS

Industrial and decorative laminates. Extruded, vacuum-formed, injection and compression-molded parts and assemblies.
Plastic pipe.

LAMINATING PLANTS

Trenton, New Jersey
Kalamazoo, Michigan

MOLDING PLANTS

Cambridge, Ohio
Dexter, Michigan

EXTRUDING AND VACUUM-FORMING PLANT

Richmond, Indiana

Panelyte plastics are also produced by licensees in Great Britain, Germany, France, Spain, Italy, Sweden, Brazil, Colombia, Australia, Japan and Union of South Africa.

LUMBER

Dried and planed lumber.
Plywood. Doors. Siding.
Moulding. Flooring. Timbers.
Treated poles and posts.
Railroad material.

SAWMILLS

Libby, Montana
Troy, Montana
Klickitat, Washington
Tacoma, Washington

PLYWOOD PLANTS

Tacoma, Washington
Olympia, Washington

DOOR PLANT

Tacoma, Washington

BY-PRODUCTS

Crude tall oil.
Sulphate turpentine.
Torula yeast. Smoked yeast.
Calcium lignosulphonate.
Pres-to-Logs.
Waste-wood briquets.

TALL OIL PLANTS

Jacksonville, Florida
Pensacola, Florida

YEAST AND CHEMICAL PLANT

Rhinelander, Wisconsin

WOOD BY-PRODUCTS PLANT

Libby, Montana

PAPER COMPANY'S PRODUCTS AND PLANTS

BAGS

Multiwall bags.
Small bags for sugar, etc.
Slit cases (BAX).
Semi-rigid containers.
Burlap and cotton bags.
Open-mesh and specialty bags.

MULTIWALL BAG PLANTS

Nazareth, Pennsylvania
Franklin, Virginia
Savannah, Georgia
Louisville, Kentucky
Pensacola, Florida
Toledo, Ohio
Kansas City, Missouri
Houston, Texas
Salt Lake City, Utah
Tacoma, Washington
San Leandro, California
Los Angeles, California
Ponce, Puerto Rico (60% Ownership)

CANADA

*Cap de la Madeleine, Quebec
*St. Lambert, Quebec
*Dryden, Ontario
*Vancouver, British Columbia

INTERNATIONAL

Tubize, Belgium
Buenos Aires, Argentina
Sao Paulo, Brazil
Recife, Brazil
Belo Horizonte, Brazil
(under construction)

TEXTILE BAG PLANTS

Houston, Texas
Lubbock, Texas
Salt Lake City, Utah
Kansas City, Missouri

Multiwall bags are also produced by licensees in the United States, Great Britain, France, Spain, Holland, Germany, Eire, Austria, Norway, Sweden, Italy, Greece, Union of South Africa, Indonesia, Australia, New Zealand, Mexico, Colombia and Peru.

*Sold after December 31, 1959.

BOXES

Corrugated boxes.
Folding boxes. Set-up boxes.
Solid fiber boxes. Wooden boxes.
Wire-bound veneer boxes.
Display containers.
Metal-edge and metal-stay boxes.

CORRUGATED BOX PLANTS

Cohoes, New York
Buffalo, New York
Mt. Wolf, Pennsylvania
Pittsburgh, Pennsylvania (2 plants)
Hagerstown, Maryland
Atlanta, Georgia
Jacksonville, Florida
Birmingham, Alabama
Grafton, West Virginia
Canton, Ohio
Cleveland, Ohio
Coshocton, Ohio
Newark, Ohio
Chicago, Illinois (2 plants)
Milwaukee, Wisconsin
Dubuque, Iowa
Houston, Texas
Garland, Texas
Dallas, Texas
Salinas, California
Fullerton, California
Tacoma, Washington

FOLDING AND SET-UP BOX PLANTS

Cleveland, Ohio
Marshall, Michigan
Birmingham, Alabama
Pensacola, Florida
Milwaukee, Wisconsin
Chicago, Illinois
Dubuque, Iowa
Dallas, Texas (3 plants)
Fort Worth, Texas
Mineral Wells, Texas

WOODEN BOX PLANTS

Savannah, Georgia
Jackson, Mississippi
Maringouin, Louisiana
Libby, Montana
Klickitat, Washington

Corrugated, folding and set-up boxes are produced in South Africa by companies, partially owned by St. Regis, that operate seven plants at Johannesburg, Capetown, Port Elizabeth, Maitland and Durban.

WRAPPERS

Bread wrappers and end labels.
Frozen food wrappers.
Printed waxed paper, cellophane and polyethylene wrappers.

CONVERTING PLANTS

Atlanta, Georgia
Birmingham, Alabama
Columbus, Ohio
Middletown, Ohio
Dallas, Texas
Houston, Texas
Seattle, Washington
San Jose, California

PACKAGING MATERIALS

Polyethylene-coated papers.
Corrugated sheets.
Single-face corrugated.
Gummed papers and tapes.
Film and foil laminations.
Wire ties and tying tools.

CONVERTING PLANTS

Pensacola, Florida
Troy, Ohio
Chicago, Illinois

CANADA

*Cap de la Madeleine, Quebec
*Vancouver, British Columbia

WIRE TIE PLANT

Cleveland, Ohio

*Sold after December 31, 1959.

PACKAGING MACHINERY

Bag-making machines.
Bag-filling and closing machines.
Automatic scales.
Packaging machines.
Box-making and closing machines.

MACHINE SHOPS AND ASSEMBLY PLANTS

East Providence, Rhode Island
Emeryville, California

CANADA

*St. Lambert, Quebec

Packaging machinery is also produced by licensees in Great Britain, France, Holland, Germany, Austria, Sweden, Italy, Australia, Denmark and Japan.

*Sold after December 31, 1959.

OTHER PAPER PRODUCTS

Envelopes.
School supplies.
Shipping labels and tags.
Paper plates.

CONVERTING PLANTS

Detroit, Michigan
Marion, Indiana
Birmingham, Alabama
Des Moines, Iowa
St. Louis, Missouri
Houston, Texas
Pico Rivera, California

Recent Pulping Processes Show Advantages in Cost Comparisons

Mills should now give serious consideration to high yield sulphite and multi-stage sodium base bisulphite processes for the production of chemical pulp for newsprint and magazine papers.

Roy W. Emery,
Roy W. Emery, Ltd.,
Toronto, Canada

Two recent developments have offered alternative pulping processes for newsprint and magazine papers where semi-bleached kraft might previously have been indicated as the most suitable chemical pulp for that portion of the furnish.

High yield sulphite pulping, using the conventional acid sulphite liquor in a hard cook followed by semi-chemical refining, has now become firmly established in Canada, and during the past two years has been well described in the trade journals serving the industry. This process, although the electric power requirements are very high, is economical in raw material consumption, and is also compatible with a substantial addition of resinous species, such as jack pine, to the regular spruce pulpwood supply, and thus may have helped to solve what has been a difficult problem for some of the mills.

During the past year some excellent descriptive material has been published outlining the special merits of bleached pulps made in Scandinavia by multi-stage sodium base bisulphite processes, and describing the related pulp mills and recovery systems. The significance of the enhanced strength qualities and screenability of these pulps when unbleached and at much higher yields has perhaps not been generally realized. Essentially, these multi-stage processes include an initial penetration stage using a sodium bisulphite liquor with little or no free SO_2 to bring the pH into the range 3.5 to 4.2. During this stage the cook is brought to maximum temperature within one to three hours, and maintained there for an interval which will depend on the following stage or stages to be used, and the resulting pulp qualities desired. Although an excellent pulp for many purposes can be produced with this single stage, the use of one or more additional stages will be found to reduce the total cooking time, and may be used to modify the pulp characteristics and in some cases to economize on chemical costs.

An acid second stage may be achieved by simply adding liquid SO_2 to the original charge at a predetermined point in the cooking cycle. A neutral or alkaline second or third stage may be effected by a partial or total withdrawal of that portion of the original liquor charge not already absorbed by the chips, and replacement with an alternate liquor fortified with sodium carbonate or caustic soda to achieve the desired pH level in the cook. Some economies in the supply of digestion chemicals may be achieved by the normal methods of recycling SO_2 gas

TABLE I

Semi-Bleached Kraft Pulp
(Final yield 46 per cent on wood, B.D. basis)

Pulpwood	1.85 cords @ $35.00	$ 64.75
Saltcake	125 lb. @ 2 cents	2.50
Chlorine	120 lb. @ 4 cents	4.80
Caustic soda	70 lb. @ 4 cents	2.80
Steam	in balance	nil
Electric power	150 kwh @ ½ cent	.75
Labor	3 hrs. @ $2.40	7.20
Supplies		4.00
Depreciation (existing plant)		13.50
Direct factory cost		$100.30

Unbleached Bisulphite—Acid Pulp
(Final yield 60 per cent on wood, B.D. basis)

Pulpwood	1.42 cords @ $35.00	$49.70
Soda ash	250 lb. @ 2½ cents	6.25
Sulphur	160 lb. @ 2 cents	3.20
Steam (make-up)	3M @ 75 cents	2.25
Electric power	150 kwh @ ½ cent	.75
Labor	3 hrs. @ $2.40	7.20
Supplies		3.50
Depreciation (existing plant)		13.50
Depreciation (new plant)		4.70
	Sub total	$91.05
Equivalent saltcake recovery	275 lb. @ 2 cents	5.50
Sulphur	30 lb. @ 2 cents	.60
Direct factory cost		$84.95

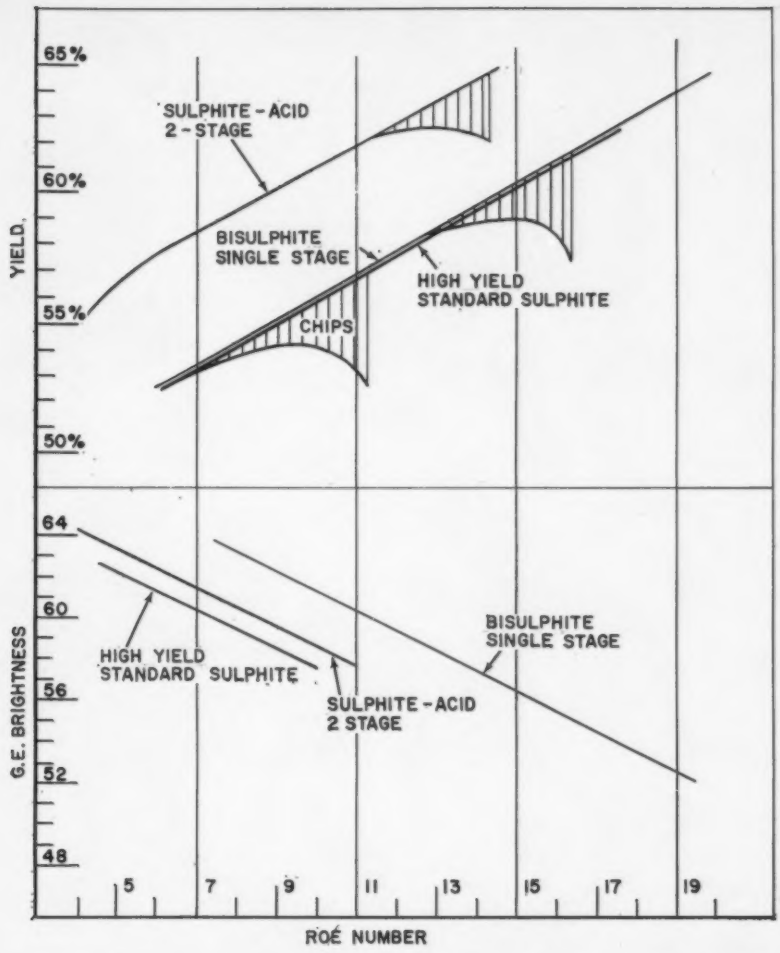


Figure 1. Relationship between pulp yield, Roe number and brightness for Swedish spruce. Curves are for (1) two stage sodium sulphite-calcium acid sulphite, (2) single stage sodium base bisulphite, (3) single stage calcium acid sulphite. To obtain per cent chlorine required to bleach to 87 G.E.: multiply 1-stage Roe No. by 1.25; multiply 2-stage Roe No. by 1.30.

relief from the acid stage, and black liquors from the alkaline, neutral, or bisulphite stages. Magnesia base liquors may be suitable and adaptable for many wood species, where pitch control is not a prime factor requiring alkaline additions to the digester following the first stage. A rather impressive series of patents have recently been issued applying to some special adaptations of these pulping methods, and more particularly to the handling and reliquefaction of SO_2, and to the recovery of heat and chemical from the waste liquors. The patents, and the details of the related process equipment and royalty charges, should be carefully reviewed for any new project.

Useful Type of Diagram

Figure I is a typical diagram showing the relationship between pulp yield, Roe number, and G.E. brightness for Swedish spruce. This particularly useful type of diagram originated with Erik Malm, who is in charge of pulping and bleaching at the Research Laboratories of Svenska Cellulosa Aktiebolaget. The upper curve in this diagram refers to their own two-stage sodium sulphite-calcium acid sulphite cooking method which was originally worked out to handle the problems encountered when spruce logs are tannin damaged. This curve follows very closely the results obtained in the two-stage sodium bisulphite acid process discussed above which differs chiefly in using the sodium base throughout, and, therefore, is more suitable for handling such resinous species as the pines. The other curves refer to single stage cooks using standard calcium acid sulphite in the one instance, and alternatively, sodium base bisulphite with no free acid, and starting at a pH level of 4.0 to 5.0. The background material for these curves has been prepared from an extensive series of laboratory cooks.

These multi-stage processes are suitable for most of the hardwoods and coniferous species, and are readily adaptable for the pines and other heavily resinous pulpwoods with the use of an alkaline or neutral stage. The resulting pulps are generally screenable without refining at much higher yields than comparable single stage sulphite or kraft pulps, and usually considerably less power and equipment will be required for refining very high yield pulps (up to 70 per cent). A review of some of the details of a recent brief examination of the comparative economics in a series of northern mills will illustrate the possibilities.

Comparative Pulp Costs

The first example relates to an existing integrated pulp mill supplying a substantial tonnage of unbleached kraft for wrapping grades and approximately 85 tons per day of semi-bleached kraft for newsprint furnish. The alternatives available to management are the supply of high yield sulphite from an existing related newsprint mill some 20 miles distant, or the supply of new facilities at the kraft mill for producing high yield sodium base bisulphite. No surplus capacity is presently available in the existing sulphite mill. Pulpwood presently supplied to both mills is chiefly spruce and balsam fir, with less than 30 per cent jack pine. A first glance at the cost of wet-lapping, shipping and repulping supplies from the related but distant newsprint mill ruled out any expansion there. New equipment required for the production of bisulphite pulp at the rather crowded site of the kraft pulp mill included new digesters, blow tank, brown stock washers, and a sulphite liquor plant. Segregated pulp storage and some other facilities are available following the bleach plant. No increase is required in wood handling, evaporators, black liquor storage and burning, nor in the causticizing plant. Capital cost of new pulping equipment installation was estimated at just over $800,000, with an additional $600,000 for a bisulphite liquor plant. Since the new bisulphite pulp would amount to nearly 30 per cent of the total chemical pulp production at the mill and would be served by the present recovery boiler, an acid second stage is indicated, to

TABLE II

Semi-Bleached Kraft Pulp
(Final yield 46 per cent on wood, B.D. basis)

Pulpwood	1.85 cords @ $30.00	$ 55.50
Saltcake	125 lb. @ 2 cents	2.50
Chlorine	120 lb. @ 4 cents	4.80
Caustic soda	70 lb. @ 4 cents	2.80
Steam	in balance	nil
Electric power	150 kwh @ ½ cent	.75
Labor	3 hrs. @ $2.40	7.20
Supplies		4.00
Depreciation		27.00
Direct factory cost		$104.55

Unbleached Bisulphite—Acid Pulp
(Final yield 60 per cent on wood, B.D. basis)

Pulpwood	1.42 cords @ $30.00	$42.60
Soda ash	250 lb. @ 2½ cents	6.25
Liquid SO_2	400 lb. @ 2 cents	8.00
Steam (make-up)	3M @ 75 cents	2.25
Electric power	150 kwh @ ½ cent	.75
Labor	3 hrs. @ $2.40	7.20
Supplies		3.50
Depreciation		22.00
	Sub total	$92.55
Equivalent saltcake recovery	275 lb. @ 2 cents	5.50
Sulphur	70 lb. @ 2 cents	1.40
Direct factory cost		$85.65

Comparable pulping costs may be obtained at a somewhat lower yield by using a single stage bisulphite cook.

Unbleached Single Stage Bisulphite Pulp
(Final yield 56 per cent on wood, B.D. basis)

Pulpwood	1.52 cords @ $30.00	$45.60
Soda ash	500 lb. @ 2½ cents	12.50
Sulphur	300 lb. @ 2 cents	6.00
Steam (make-up)	2.5 M @ 75 cents	1.90
Electric power	150 kwh @ ½ cent	.75
Labor	3 hrs. @ $2.40	7.20
Supplies		3.50
Depreciation		22.00
		$99.45
Equivalent saltcake recovery	550 lb. @ 2 cents	11.00
Sulphur	100 lb. @ 2 cents	2.00
		$86.45

keep the total soda supplied to the sulphite system within the net soda requirements for make-up to the kraft liquor system. In order to maintain the sulphur balance within the system, it will also be necessary to install an SO_2 liquefaction system, cost of which is included above in the liquor plant.

Depreciation costs allocated to the semi-bleached kraft system are based on the present book value of the existing facilities used, and for the purposes of this review are retained and added to the depreciation costs for new equipment allocated to the proposed bisulphite pulping. On this basis, comparative pulp costs were estimated as shown in Table I.

Consider Bisulphite for Newsprint

The second example is cited as a hypothetical mill already producing unbleached kraft, N.S.S.C. and groundwood pulps, and purchasing from an outside source unbleached standard sulphite pulp for inclusion in regular news furnish. The unbleached kraft pulp is used largely in the manufacture of kraft liner board. Several years ago, if the owners of such a mill had decided to supply their own chemical furnish for news, any proposal to produce standard calcium base sulphite, or even high yield sulphite, might have been readily rejected in favor of semi-bleached kraft, in order to retain the economy of chemical and heat recovery from the waste liquors, and to avoid a possible new waste disposal and pollution problem.

This mill should now give serious consideration also to the alternative provision of new facilities for the production of bisulphite pulp for the newsprint chemical furnish. This proposal would provide for either single or two stage bisulphite pulping, and would require the provision of acid-proof equipment at the digesters and blow tank, and through the brown stock washers and up to the evaporators where the bisulphite and kraft liquors would be blended together for recovery. Also required would be some modifications and additions to the existing neutral sulphite liquor plant to provide for the preparation of the sodium bisulphite liquors. Additional capital requirements for this equipment as compared with the equivalent installations for bleached kraft pulps would be on the order of $500,000. These additional costs would be more than offset by the reduction in requirements for increased capacity in the woodyard and in the evaporator and recovery systems, and in avoiding the requirement for a bleach plant.

Pulpwood supplied to the kraft pulp mill can be assumed to be at least 50 per cent spruce, with the balance largely jack pine, balsam fir and aspen poplar, so that no bleaching of bisulphite pulps would be required for the newsprint furnish. Pitch control is not likely to become a major problem, and a second pulping stage, if used, can be either acid or alkaline. If it is decided to produce bisulphite pulp in excess of the requirements for newsprint, this would require no changes to the present chemical recovery system, provided the total soda and sulphur recovery from the bisulphite system is not greater than the make-up requirements for the existing kraft system. The choice of the bisulphite stages to be used will therefore be independent of technical difficulties relating to wood species or to the limitations of the recovery system, and can be selected on the basis of economics and final pulp qualities.

In assessing a possible development of bisulphite pulping at such a mill it has been assumed that only fully screenable pulps will be produced initially, and that the provision of semi-chemical refining equipment will be added at a later date for handling yields up to 70 per cent. In the meantime, a comparison of estimated costs for producing fully screenable pulps by the semi-bleached kraft, single stage bisulphite, and

two stage bisulphite acid processes are summarized in Table II.

Upgrade Lines With Bisulphite

The third example relates to a mill producing conventional groundwood and both bleached and unbleached sulphite pulps, and manufacturing newsprint and a variety of tissues, papers and boards. Management is faced with the need to purchase increasing quantities of bleached kraft to upgrade some of their lines, and long range planning will necessarily include a solution to the present waste liquor disposal problem. Coniferous pulpwood species include a high proportion of jack pine, but this resinous wood is now largely allocated to groundwood pulps. The use of a substantial quantity of deciduous species is an essential part of woodlands economy.

Bleached and semi-bleached kraft will be given serious consideration for future installation, but this mill will still require continuing large quantities of sulphite pulps for many of their lines. The alternative direction for a long range program will be a flexible sodium base bisulphite pulp mill and recovery system to produce a variety of two stage bisulphite pulps, using acid, neutral or alkaline second stages, with a range of unbleached pulp yields varying from 50 to 80 per cent depending on the wood species and the end use of the pulp. No doubt most of the bleached kraft pulps now purchased will then be replaceable with strong bleached bisulphite.

In the meantime management should review the possibility of replacing immediately the present newsprint grades with a bisulphite pulp. An acid second stage is again indicated, this time because no means are available in the existing plant to recover the sodium base. So long as the proportion of jack pine allocated to this pulping is not too high, pitch control will be no problem. The new sulphite liquor system will be linked in, as far as possible, with the existing plant, and new equipment added to liquefy SO_2 for addition to the acid second stage. A screenable pulp is available at 60 per cent yield, and the cost of this pulp is compared with a refined 65 per cent yield pulp as well as with the present calcium base product at 50 per cent yield.

Capital requirements to produce 100 tons per day of sodium base bisulphite pulp include a total of $150,000 for repointing and otherwise adapting the present brick-lined digesters, and for segregating the equipment and storage units allocated in the existing plant to handle the new pulp grade or grades. In addition there will be an expenditure of $400,000 for additions to the liquor plant including the SO_2 liquefaction unit, and a further $450,000 for the optional high yield refining and cleaning section. Costs of production for the three pulps were roughly estimated as given in Table III.

Examination of the economics of a complete changeover to either kraft or sodium base bisulphite cooking was complicated by the day to day changes in orders and paper grades manufactured, and would have involved a careful re-study of the furnishes to a large proportion of the paper and board grades manufactured. In the time available for this brief study, it was not possible to review in detail the comparative capital costs for a complete change to all kraft or all bisulphite, but it is assumed that, by utilizing some of the existing liquor plant, bleach plant, and digester facilities, the usually higher costs of a sodium base bisulphite recovery system might be largely offset.

TABLE III

Unbleached Sulphite Pulp—Calcium Base
(50 per cent yield on wood, B.D. basis)

Pulpwood	1.70 cords @ $35.00	$59.50
Limestone	250 lb. @ 0.4 cents	1.00
Sulphur	190 lb. @ 2 cents	3.80
Steam	6M @ 75 cents	4.50
Electric power	150 kwh @ ½ cent	.75
Labor	3½ hrs. @ $2.40	8.40
Supplies		3.50
Depreciation (existing plant)		10.00
Direct factory cost		$91.45

Unbleached Bisulphite—Acid Pulp
(60 per cent yield on wood, B.D. basis)

Pulpwood	1.42 cords @ $35.00	$49.70
Soda ash	250 lb. @ 2½ cents	6.25
Sulphur	160 lb. @ 2 cents	3.20
Steam	5M @ 75 cents	3.75
Electric power	200 kwh @ ½ cent	1.00
Labor	3½ hrs. @ $2.40	8.40
Supplies		3.50
Depreciation (existing plant)		10.00
Depreciation (new installation)		1.85
Direct factory cost		$87.65

Unbleached High Yield Bisulphite Acid Pulp
(65 per cent yield on wood, B.D. basis)

Pulpwood	1.3 cords @ $35.00	$45.50
Soda ash	230 lb. @ 2½ cents	5.75
Sulphur	150 lb. @ 2 cents	3.00
Steam	4.8M @ 75 cents	3.60
Electric power	550 kwh @ ½ cent	2.75
Labor	3½ hrs. @ $2.40	8.40
Supplies		3.50
Depreciation (existing plant)		10.00
Depreciation (new installations)		3.35
		$85.85

Summary

An inspection of the unit costs allocated to the various raw materials and services in all of the above examples will indicate that these are not actual, but rather, typical or average figures, and except for wood costs, the same units have been used throughout. The reduced wood cost figure is applicable to a mill located on or very close to the tributary woodlands, and the higher figure represents additional transportation costs to the other two mills.

Depending on the machine speeds and the comparative strength characteristics of the kraft or sulphite pulps to be replaced, there may be a variation of as much as one or two per cent either way in the requirement for chemical pulp in the newsprint furnish due to the replacement, and this factor should be considered in any comparative analysis.

Round-up on Projected Pulp Mills For British Columbia

Six general areas are at present under consideration by seven companies for new pulp mills in British Columbia. The majority of these are in the interior of British Columbia or would depend on interior forests whose potentials are still largely untapped. There are at present no mills in operation in the B. C. interior but one large bleached kraft pulp mill is under construction for start-up early in 1961 by Celgar, Ltd.

Peace River Project

Two companies are actively interested in establishing a pulp mill in the northern interior, as indicated on the map. These are the Wenner-Gren Development Co. (headed by the Swedish financier of that name) and the 22 year old Fort St. John Lumber Co. with head office in Vancouver.

Prince George Project

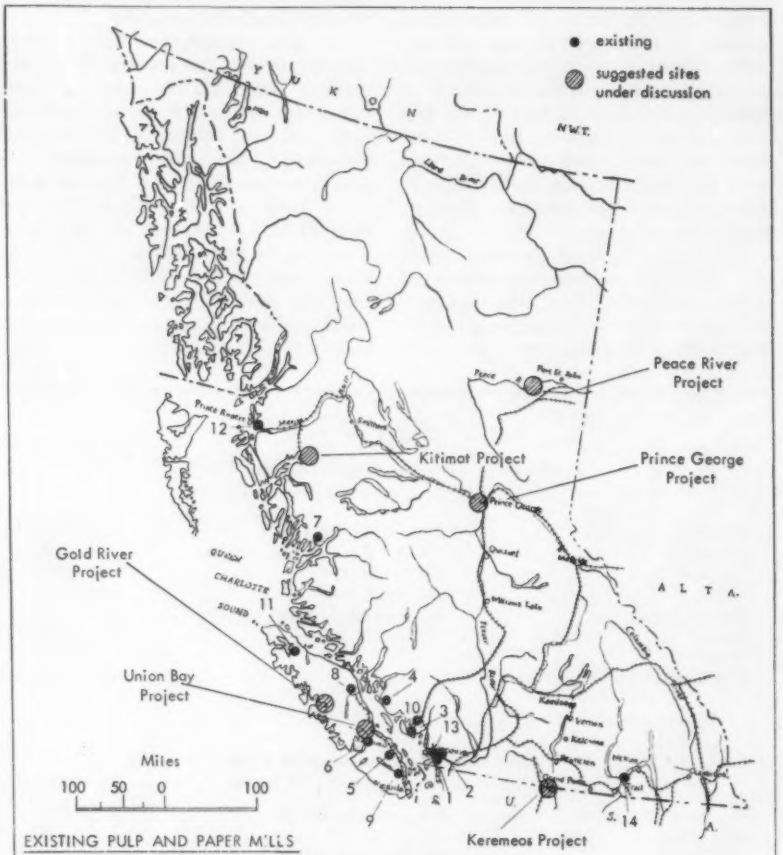
Plans for establishing a pulp mill in this central interior region have been under consideration for many years by a number of interested groups. One of the most active is Northern Spruce Co., Ltd. This company has had sawmilling operations in Prince George since 1944.

Keremeos Project

John Lultin, Ltd., has expressed interest in building a mill on the British Columbia-Washington border as shown on the map. The company has conducted logging and sawmilling operations in this area since 1952. It is associated with Sinclair Spruce Lumber Co., Northern B. C. sawmillers. Both are subsidiaries of Midway Terminals, Ltd., of Vancouver.

Union Bay Project

Canadian Colleries Resources, Ltd., a very diversified B. C. Company, is exploring the possibility of building a pulp mill at Union Bay and it is said would be willing to consider a partner with pulp and paper mill experience. Union Bay is about half way between the existing mills near Nanaimo and Elk Falls.


existing
suggested sites under discussion
Peace River Project
Kitimat Project
Prince George Project
Gold River Project
Union Bay Project
Keremeos Project
Miles
100 50 0 100
EXISTING PULP AND PAPER MILLS
1. New Westminster Paper Co. Ltd. - New Westminster
2. Canadian Forest Products Ltd. - New Westminster
3. Canadian Forest Products Ltd. - Port Mellon
4. MacMillan, Bloedel & Powell River Ltd. - Port Mellon
5. MacMillan, Bloedel & Powell River Ltd. - Nanaimo
6. MacMillan, Bloedel & Powell River Ltd. - Port Alberni
7. Crown Zellerbach of Canada Ltd. - Ocean Falls
8. Crown Zellerbach of Canada Ltd. - Elk Falls
9. B.C. Forest Products Ltd. - Crofton
10. Rayonier Canada Ltd. - Woodfibre
11. Rayonier Canada Ltd. - Port Alice
12. Columbia Cellulose Ltd. - Port Edward
13. Sidney Roofing & Paper Co. Ltd. - Vancouver
14. Celgar Ltd. (under construction)

This map of British Columbia shows both the existing mills and the proposed projects. It was prepared by the B.C. Department of Industrial Development.

Kitimat Project

Kitimat Pulp & Paper Co. is jointly owned by Aluminum Co. of Canada and Powell River Co. (now MacMillan, Bloedel & Powell River Co.). The company's request for a forest license was rejected but the B. C. Forest Service has indicated that this may be subject to reconsideration.

Gold River Project

Tahsis Co. (subsidiary of East Asiatic Co.) a major forest industry company in the region, is investigating the possibility of establishing a pulp mill on the west coast of Vancouver Island. The most promising site seems to be at the mouth of the Gold River on Macholet Inlet.

MAINTENANCE SERIES
NUMBER 14

Main Concern of the Modern Supercalender Is Its Filled Rolls

. . . although not enough emphasis can be placed on proper foundations and accurate installation, says the author, of this massive piece of equipment.

Eric B. Norman,
Asst. Sales Manager,
B. F. Perkins & Son, Inc.
Holyoke, Mass.

As greater emphasis is placed on the surface and optical qualities of printing, glassine and waxing papers, it has meant a tremendous influx in the number of supercalenders required by the paper industry. Possibly due to the benefits of supercalendering being immediately obvious, there seems to be a general feeling that this piece of equipment should be given top priority in location, installation and maintenance. No doubt, as well as the aforementioned reasons, initial cost, expected life, and the terrific weight of the modern supercalender, influence top management in arriving at the decision to give the supercalender the consideration it receives.

Massive Foundations Needed

Modern calenders, due to high speeds, high pressures, and the number of accessories attached to the frames, are considerably more massive than those manufactured a decade or so ago. Today's calenders have welded steel frames, hydraulically-operated platforms, an assortment of winds and unwinds, and weigh approximately 150-175 tons.

Due to the enormous weight involved, a thorough investigation should be made to establish the type or types of soil and rock under the proposed site of the calender. The results of this survey, coupled with knowledge of the total weight of the installation, determine how extensive and elaborate a foundation is required.

A typical example of a foundation is a recent installation that weighed approximately 155 tons and required the pouring of 127 cubic yards of concrete on top of solid bedrock. Enough emphasis can not be placed on the main calender frames being perfectly plumb and the alignment of the main drive and bottom roll being extremely accurate.

Breaking-in Filled Rolls

The major maintenance problem of a supercalender is in the care of the filled rolls. As these rolls are composed of materials that are relatively easy to stain and damage, the wapper in which they are received from the manufacturer should be left on the roll until it has been completely installed. This will minimize the possibility of the roll being marked through contact with chain falls, etc., and will eliminate the possibility of the roll being stained by grease or oil. It will also prevent foreign objects, such as steel chips, becoming embedded in the surface. When the roll has been completely installed, the protective wrapper is removed and the roll is ready to be broken in.

Break-in times and procedures vary considerably from mill to mill; but, as a general rule, the more resilient the roll filling, the longer the break-in time required. Break-in time is a good investment as the crust formed provides a resistance to coating lumps, creases and other paper imperfections. Past experience has shown that rolls which have been adequately broken-in have a substantially longer life. In order to reduce break-in time, most roll manufacturers finish-grind the roll surface rather than machine it in a lathe. This reduces the porosity of the roll surface and makes it more susceptible towards developing a crust.

When the calender is ready to start up, the rolls should be brought to-

"Roll break-in time is a good investment as the crust formed provides a resistance to coating lumps, creases and other imperfections in the sheet."

"The sanding of rolls is a procedure that is frowned upon. It is improbable that an accuracy to within 0.001 inch can ever be maintained by this practice."

gether with a minimum of pressure, and water applied sparingly. As the surface temperature of the roll increases, sufficient water should be applied to insure against the roll overheating and burning. Pressure should be increased gradually and water applied more often as the roll temperature mounts. Experience in breaking in rolls and familiarity with the various roll fillings are the best guide in determining when a sufficient crust has been established to put the roll in service. As the roll, by this time, has absorbed a great deal of water, it should be allowed to run without paper until it is perfectly dry.

Surfacing Filled Rolls

The sanding of rolls is a procedure that has always been frowned on. Assuming that the rolls in the calender are exact to within 0.001 inch, it is highly improbable that anyone can maintain this accuracy when sanding with a power sander or block. However, despite the foregoing, there are many times when sanding is necessary due to production schedules, etc. At these times, a light sanding with a number 80 paper and a finish sanding with a 100 grit paper will remove edge marks, shear cuts or assist in making paper lay-up properly. It seems appropriate at this time to quote the axiom that "supercalendering will not hide paper imperfections but will tend to magnify them".

Calender rolls can be machined either running on centers or on their journals. Experience has shown that, for a roughing cut, a carbon steel turning tool has proven very satisfactory. This, combined with a cutting speed of 350 f.p.m., a feed of approximately .040 per r.p.m., and a cutting depth of 1/16 inch to 1/8 inch, depending on the hardness of the surface crust, usually prepares the roll surface for either a finishing cut with a diamond turning tool or grinding. When using a diamond turning tool, speeds of 1000 to 1200 f.p.m., and a feed of .020 per r.p.m. have been found satisfactory.

When an acceptable surface has been obtained, the steel heads on the roll should be machined to 1/4 inch below the roll surface and a 45 degree chamfer machined at each end.

To Summarize

It might be pointed out at this time that, while this article has dealt primarily with the maintenance of calender rolls, there should be no intention of overlooking the other maintenance problems that are experienced, namely, periodical inspection of bearings, lubrication system, pressure loading system, doctor blades and holders, electrical circuits and safety devices.

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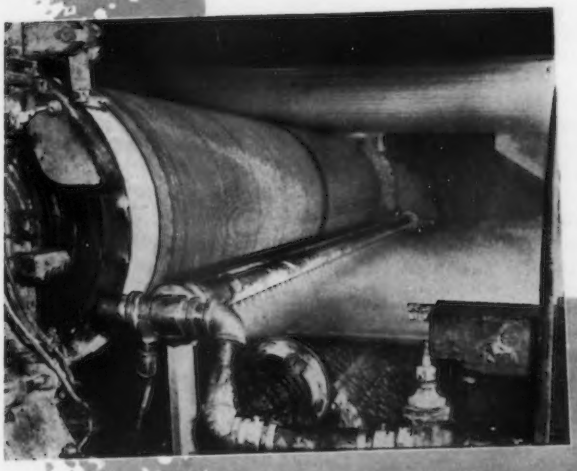
L.J.Dolhof



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J-3

TALK IT OVER WITH YOUR ALBANY FELT SALES ENGINEER

Capital Cost Estimate for a Kraft Pulp Mill

The following interesting Table is from the publication "Potential Pulp and Paper Mills in British Columbia" by the Dept. of Industrial Development of the provincial government.

This is said to be a very general estimate of the minimum capital costs of a modern 500 ton bleached kraft pulp mill, assuming it would be located in the central interior of British Columbia. The cost of a mill on the coast would probably be somewhat less due to cheaper transportation of equipment and structural material. This estimate is based on recent engineering studies that were made available to the Bureau of Economics and Statistics.

It was pointed out that there would be a wide variation in costs between mills, particularly in the first three items; therefore, the coverage of these items is defined in more detail than the others.

500 Tons per Day of Fully Bleached Pulp

	Structures ($'000)	Equipment ($'000)
Site Preparation Includes sewer system, storm drains, track facilities, etc (Does not include effluent treatment or disposal.)	$1,000	$ 250
Water Supply and Distribution Does not include storage pond, dam pumping or treating facilities.	50	300
Power Distribution Includes substation, but not generation.	50	1,000
Fuel Storage and Handling	50	100
Steam Production and Distribution	300	2,000
Wood Preparation Includes log handling, storage, chipping, chip storage and handling.	1,500	2,800
Primary Pulp Preparation Includes digesting, washing and screening.	700	3,500
Evaporation and Recovery Unit Includes smelter	900	4,000
Causticizing Plant	500	700
Bleaching Plant Including liquor preparation.	700	5,000
Lime Plant	—	1,000
Pulp Dryer and Baler	800	3,500
Pulp Storage and Shipping	250	50
Fire Protection Including fire hall and engines.	200	200
Warehouse Including nominal inventory and mill stores.	100	300
Repair and Maintenance Including machine shop, carpentry shop, foundry, etc.	300	200
Traffic Equipment Including fork trucks, pickup, as well as heavy trucks.	300	50
Offices Administration, engineering and technical control.	300	50
TOTAL	$8,000	$25,000
Equipment		$25,000
Structures		8,000
TOTAL DIRECT COST		$33,000
Construction overhead, equipment placement, engineering, etc.		8,000
Contingencies—(10% of total previous items.)		4,000
TOTAL CAPITAL COST OF 500 TON MILL		$45,000

FROM DU PONT RESEARCH . . .

The first Titanium Dioxide Pigment

COMPARISON OF RETENTION PROPERTIES between "Ti-Pure" HR and conventional TiO_2 is demonstrated by Dr. Harold C. Brill, Paper Section Manager, at the Du Pont Pigments Department, Technical Service Laboratory. Mixtures of chlorinated starch and pigment were prepared and then poured through filter paper. Note particles of the conventional pigment have run through the filter paper in left test tube, while the HR filtrate in the right test tube remains clear. HR has not passed through the paper. Your Pigments Representative will perform this desk-top experiment for you in your plant, if you wish.

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"Ti-Pure" HR offers better one-pass retention in the presence of oxidized starches than any other pigment. (The HR stands for High Retention.) In systems without starch, HR has retention equal and sometimes superior to commonly used beater-grade pigments.

Plant run shows difference in retention

In a typical plant run, the titanium dioxide content of finished sheets showed these differences: conventional titanium dioxide plus a retention aid, 5.0%; "Ti-Pure" HR, under optimum conditions, 6.4%.

This superior retention naturally means less pigment loss to the sewer, less load on save alls. Several mills that have recently switched to "Ti-Pure" HR report savings up to 15% in pigment costs.

HR has unique properties

"Ti-Pure" HR is a water-dispersible pigment that can be added dry, or used in mills with wet slurry systems. It has outstanding suspension properties, minimizing the problem of settling in the float chambers of the metering pump. HR is not flocculated until alum or other flocculating agents are added and offers opacity and brightness, dry or waxed, similar to commonly used beater grades of anatase TiO_2.

RESULT: BETTER CONTROL over the pigment content of your papers, more uniform paper quality. Let your Du Pont Pigments Representative tell you about "Ti-Pure" HR. He'll run a demonstration for you that dramatically compares the retention qualities of HR with a standard pigment (see picture left).

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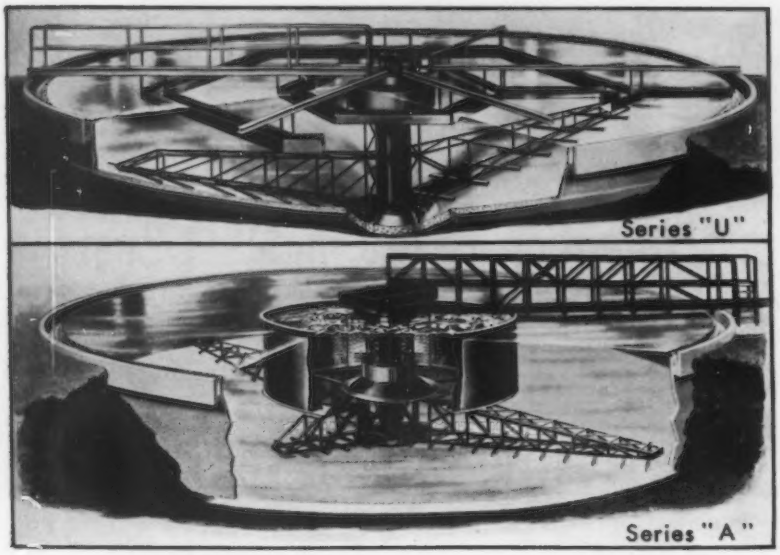


Collectors Aerate and Settle Sludge

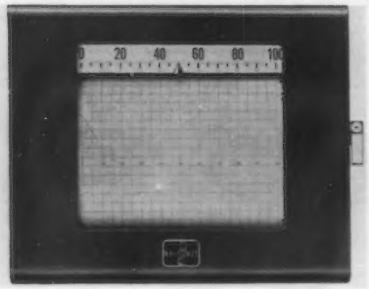
Two series of Circuline sludge collectors for treatment of settling tanks have been announced by Link-Belt Co. They extend the company's line to six series and 15 types of Circuline collectors.

The Series U is a Uniflow settling tank with a rapidly sloping bottom, tank-type sludge collector and multiple effluent weirs. Important savings in construction costs are possible with this Uniflow tank, claims Link-Belt, since the sloping bottom permits the volume of the tank to be reduced 25 per cent or more without reducing the surface area or overflow rate.

The series A is an aeration sludge collector for pre-aeration and settling. It consists of a single circular tank in which both aeration and settling are accomplished. The collecting mechanism removes the solids from both the aeration compartment and the settling compartment. These collectors are built in two types — Type AP for preliminary aeration of 30 to 60 minutes and Type AT for total aeration with extended aeration up to 24 hours or more. Pre-aeration is an efficient and economical method for increased removal of suspended solids and biochemical oxygen demand (B.O.D.) from wastes.

Additional information on the two additional series is contained in Book 2546, "Circuline Sludge Collectors," available from Link-Belt Co., Dept. PR, Prudential Plaza, Chicago 1, Ill.

Instrument Records Draw-Speeds



The Bristol Dynamaster Recorder, is also available in a Draw-Speed Recording model. This model provides a guide for controlling draw-speed, thereby eliminating costly paper breaks. By knowing the speeds of the couch and press rolls, an operator can pin-point trouble spots and adjust speeds to maintain proper paper tension.

The recorder has a manual multi-point switch for recording selected draw-, couch-, and press-roll speeds; and ranges are available for all applications.

An added feature is a temper-proof compensator for roll diameter changes (allowing for wear, etc.) Bristol DC Tachometer Generators attached to various press and couch rolls supply necessary information to the instrument for recording draw-speed and section speeds.

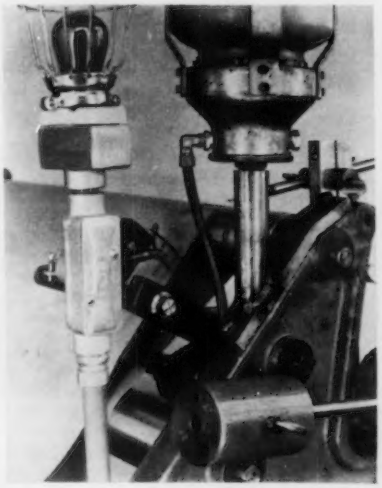
The Dynamaster Draw-Speed Recorder is available for 120-volt, 60, 50, and 25 cycle supply. Further information is available from the Bristol Co., Waterbury 20, Conn.

Electronic Detection Of Faulty Bag Seams

The often unavoidable production of hundreds of bags with faulty, unpasted seams is said to be eliminated with an electronic detector developed by Potdevin Machine Co., Teterboro, N. J. The Potdevin seam paste detector warns the instant the seam of the running web is interrupted or is without paste.

An electronic, resistance-sensitive relay is immediately activated by two feelers mounted directly over and touching the seam paste line on the running web. The relay operates a red warning light which stays on until the machine operator presses a push-button. This eliminates any chance of the warning going unnoticed by the machine operator.

The Potdevin seam paste detector may be installed anywhere along the running web length. It eliminates the need for seam inspection. The unit may be adjusted to warn of paste breaks of from ⅛-inch to 12-inches. Additional information may be obtained from Potdevin Machine Co., 285 North Street, Teterboro, N. J.



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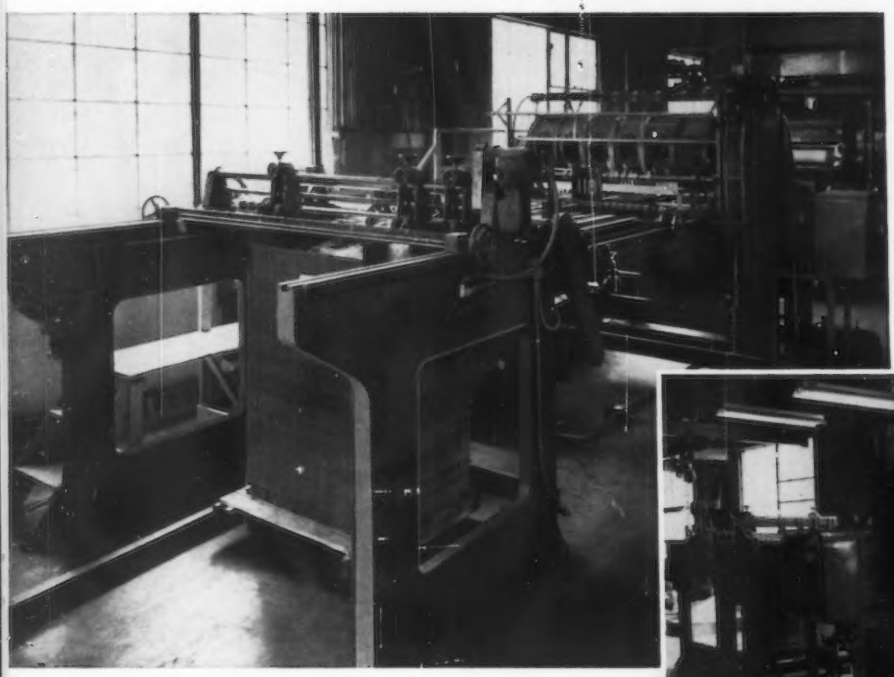
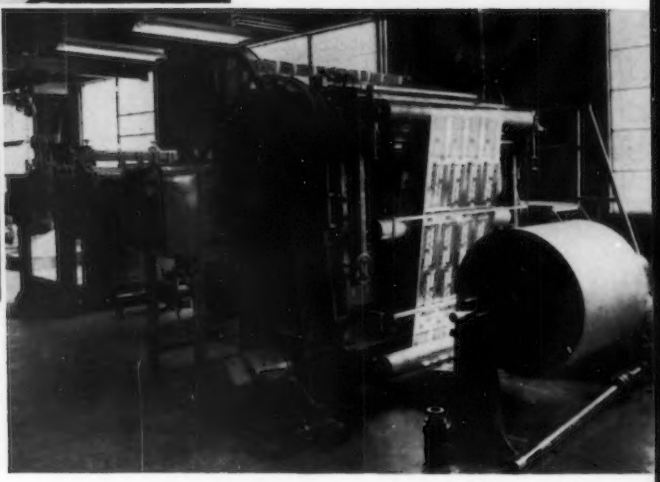


BOOSTS FINISHING ROOM PROFITS



at Pacific Coast Foil Company's San Francisco Plant . . .

Summarizing Pacific Coast Foil Company's experience in sheeting foil on Clark-Aiken equipment, Mr. R. Shelley Wood, Jr., assistant to the president, writes:

"Our Clark-Aiken sheeter displays the versatility necessary to make it a profitable adjunct to our aluminum foil converting operation. We sheet laminated materials of a wide weight range with equal facility. Even single roll feeding of the lightest weight materials presents no problem. In addition, the sheeter handles with equal ease, any sheet size normally needed in a converting operation. It adjusts to rapid short run changeovers to different sheet sizes with a minimum of set-up time. One of its most valuable features, in our operation, is the overlapping delivery and jogging which almost eliminates hand work in succeeding operations. This, of course, leads to great savings in production time and shortens our delivery schedules. Other salient points are the ease with which it adapts to electric eye control and the absence of all but the most nominal maintenance costs."

Clark-Aiken Equipment is custom tailored to your finishing room requirements . . .

Pacific Coast Foil Company's experience is typical of the results achieved through practical finishing room automation engineered by Clark-Aiken to fit specific requirements.

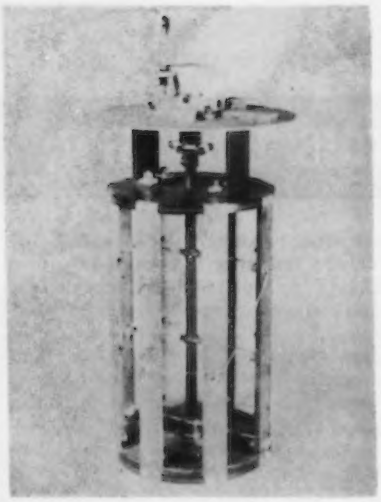
If your converting operation is bogged down because of slow or inefficient foil sheeting place your problem in the hands of Clark-Aiken engineers with complete confidence. Let them analyze your needs and make recommendations based on their findings. You will realize the benefits that only modern production techniques and up-to-date machinery can assure you.

You profit three ways—increased production, lower operating costs and minimum maintenance costs. Consult Clark-Aiken for prompt and qualified consideration of your finishing room production problems.

THE Clark-Aiken COMPANY

956 SPRINGFIELD ROAD

LEE, MASSACHUSETTS



Switch, Damper for Electrostatic Precipitators

Buell Engineering, 123 William St., New York, N.Y., announces high-voltage switch especially designed for distributing power from rectifiers to the electrodes of electrostatic precipitators. The switch is a multi-deck rotary type designed to operate in all types of insulating oils. It may be housed in its own compartment, in which case it occupies about one cubic yard of space. It may also be immersed in the same compartment as the transformer-rectifier, in which case the transformer-rectifier compartment is lengthened or widened approximately two feet.

The totally enclosed switch offers the further advantages of freedom from corrosive effects of atmospheric elements and freedom from possible deposits of air-borne dusts.

The switch is engineered for 100,000 volts and 1 ampere. Switch action is of the double-blade type and large surface contacts withstand brief, but extremely steep, feedbacks. The switch can be operated under load if necessary.

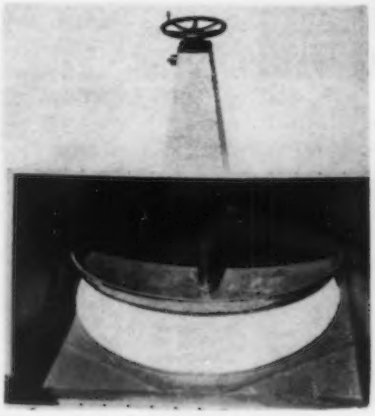
Structural members of the switch are of epoxy resins. The standard switch consists of a three-deck arrangement as illustrated. When used with a system having two rectifiers and two precipitator units, it could be wired so that either of the rectifiers could be connected to either of the precipitator units; so that one rectifier could be connected with one of the precipitator units, the remaining rectifier being grounded; or so that both rectifiers are grounded.

Switches can be used in groups when more complex circumstances dictate or they can be connected so that various combinations of half-wave, full-wave or complete grounding of rectifier, transformer, and connected precipitator can be achieved. Provisions are made for use of safety-key interlocks.

American SF Products, Inc., 421 Lexington Ave., New York 21, N.Y., announces the availability of a shut-off damper for flue gas ducts. The unit consists of a damper housing, a valve disc and an operating device. The damper is absolutely tight-fitting and very simple in operation. No dust from the flue gases can accumulate to obstruct the function of the dampers, it is claimed.

The valve disc has a hinged connection to the stem which is governed from outside. When adjusted from the closed position, the valve disc turns at an angle to the side of the damper housing. When the damper is fully open, the disc is close to the wall of the housing and the passage of gas is entirely unimpeded.

As the damper is designed, it can be easily installed in various systems of flue gas ducts. It is manufactured in standard sizes capable of handling gas or air quantities from 6,000 to 250,000 cubic feet per minute.



Magnetic Pulleys Have Radial, Longitudinal Fields

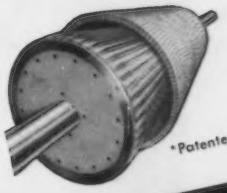
The Model CR pulleys by Eriez Manufacturing Co. are constructed with a radial design to maintain a magnetic field suitable to heavy applications involving large pieces of tramp iron. The radial pattern of the field automatically aligns heavy metal parallel to the shaft for positive, slip-proof separation. This model is available in 12-inch through 36-inch diameters.

Where small or medium tramp iron, as well as fine iron contamination in average material flows, is the principal threat, the Model AA pulley is recommended. Built with magnetic

(Continued on page 70)

St.Regis PAPER COMPANY

Join the parade of leading mills saving money with JONES ADAPTA-PLUG* and FULBAR FILLINGS



*Patented

KRAFT

Leatherneck PAPERS

CC

HAMILTON PAPER COMPANY

COMBINED LOCKS PAPER CO. COMBINED LOCKS, WIS. QUALITY PAPER SINCE 1889

Ecusta

H&V

THILCO PRODUCTS P&P COMPANY

E. D. JONES CORP. MEMBER BELOIT GROUP PITTSFIELD MASS.

Jones

PULP MILL EQUIPMENT AND STOCK PREPARATION MACHINERY

Armco Stainless controls corrosion in

Digester linings, accessories and liquor-handling equipment made of Armco Stainless Steels offer stubborn resistance to corrosion.

Linings of Armco 18-12 Mo ELC (Type 316L) Stainless, for example, have given excellent service in the nine years since they were installed in digesters at a southern kraft mill.

At a northern sulphite mill, the strength-with-light-weight of Type 316 stainless acid lines has eliminated the need for supports and special framework used when the lines were made of another material. At the same mill, digester necks, flanges, filters and screens are all-stainless.

Equal benefits are provided by stainless digester linings, accessories and circulating system parts for soda and NSSC mills.

SEND FOR NEW BOOKLET

How Armco Stainless Steels Improve Pulp, Paper and Profit describes where and why specific types of Armco Stainless Steels are used at each step of processing. One entire section is devoted to the important problem of corrosion, with extensive tables of useful data.

Just send the coupon for your free copy or ask for one from an Armco Distributor listed in this ad.

Quick Delivery

Dependable service of Armco Stainless Distributors can help *your* digestion, too. Because they carry ample stocks of standard Armco Stainless Steels in a wide range of gages, sizes, and shapes, the stainless you need can reach you within 8 hours after you call.

In addition, Armco Distributors can help you save scrap and wastage by cutting, shearing, or otherwise tailoring Armco Stainless to your exact needs. Then, too, their mill-trained staffs can provide valuable assistance to your engineers and equipment fabricators.

Next time you need stainless steel, make sure you get this personalized service. Just contact the Armco Distributor near you. He's listed in this advertisement.

Get Armco Stainless Steels from

(A) — Sheet, strip & plate
(B) — Bar and Wire

ALABAMA
Birmingham
J. M. Tull Metal & Supply Co. (AB)

ARIZONA
Phoenix
Ducommun Metals & Supply Co. (AB)

CALIFORNIA
Berkeley
Ducommun Metals & Supply Co. (AB)
Emeryville
Electric Steel Foundry Co. (AB)
Los Angeles
Ducommun Metals & Supply Co. (AB)
Electric Steel Foundry Co. (AB)
Earle M. Jorgensen Co. (AB)
National City
Ducommun Metals & Supply Co. (AB)
Oakland
Earle M. Jorgensen Co. (AB)

COLORADO
Denver
C. A. Crosta, Inc. (A)
Electric Steel Foundry Co. (AB)
Earle M. Jorgensen Co. (AB)
Metal Goods Corp. (AB)

CONNECTICUT
Hartford
The American Steel & Aluminum Corp. (AB)
Peter A. Frasse & Co., Inc. (AB)

FLORIDA
Jacksonville
J. M. Tull Metal & Supply Co. (AB)
Miami
J. M. Tull Metal & Supply Co. (AB)
Tampa
J. M. Tull Metal & Supply Co. (AB)

GEORGIA
Atlanta
J. M. Tull Metal & Supply Co. (AB)

ILLINOIS
Chicago
Central Steel & Wire Co. (AB)
Chicago Steel Service Co. (B)

KANSAS
Wichita
Metal Goods Corp. (AB)

LOUISIANA
New Orleans
Metal Goods Corp. (AB)
The Orleans Steel Prod. Co., Inc. (A)

MAINE
Auburn
Brown-Wales Company (AB)

MARYLAND
Baltimore
Seaboard Steel & Iron Corp. (B)

MASSACHUSETTS
Cambridge
The American Steel & Aluminum Corp. of Massachusetts (AB)
Brown-Wales Company (AB)
Industrial Stainless Steels, Inc. (B)
Fall River
Congdon & Carpenter Co. (AB)
Worcester
Brown-Wales Company (AB)

MICHIGAN
Detroit
Central Steel & Wire Co. (AB)

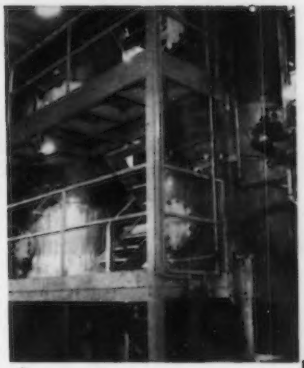
MINNESOTA
St. Paul
Paper-Calmenson & Co. (A)

MISSOURI
Kansas City
Richards & Conover Steel & Supply Co. (A)
North Kansas City
Metal Goods Corp. (AB)
St. Louis
Metal Goods Corp. (AB)
E. E. Souther Iron Co. (A)

NEBRASKA
Omaha
Gate City Steel, Inc.—Omaha (A)

digester systems

Digester necks, flanges, filters and screens for digesters in a northern sulphite mill are now Type 316L stainless steel, as are spot-weld linings on digester covers. All these parts were previously made from a non-ferrous metal.



These Type 316L stainless steel acid towers and the cooling tower that accompanies them were installed four years ago. All are in top condition.

Stainless steel linings in these digesters at a southern kraft mill have given excellent service for the past nine years. Linings for all four of these digesters are Armco 18-12 Mo ELC (Type 316L) Stainless.

these steel service centers

NEW YORK
- **Buffalo**
  - Peter A. Frasse & Co., Inc. (AB)
  - Seneca Steel Service Co. (AB)
- **Syracuse**
  - Peter A. Frasse & Co., Inc. (AB)

METROPOLITAN NEW YORK
- **New York City**
  - Peter A. Frasse & Co., Inc. (AB)
- **Hillside, N. J.**
  - Edgcomb Steel & Aluminum Corp. (AB)
- **Lyndhurst, N. J.**
  - Peter A. Frasse & Co., Inc. (AB)
- **Union, N. J.**
  - Mapes & Sprowl Steel Co. (AB)

NORTH CAROLINA
- **Charlotte**
  - Edgcomb Steel Co. (AB)
- **Greensboro**
  - Edgcomb Steel Co. (AB)

OHIO
- **Cincinnati**
  - Central Steel & Wire Co. (AB)
- **Cleveland**
  - Cleveland Tool & Supply Co. (B)
  - Viking Steel Co. (AB)
- **Columbus**
  - Vorys Brothers, Inc. (AB)

OKLAHOMA
- **Tulsa**
  - Earle M. Jorgensen Co. (AB)
  - Metal Goods Corp. (AB)

OREGON
- **Eugene**
  - Electric Steel Foundry Co. (AB)
- **Portland**
  - Electric Steel Foundry Co. (AB)

PENNSYLVANIA
- **Philadelphia**
  - Edgcomb Steel Co. (AB)
  - Peter A. Frasse & Co., Inc. (AB)
- **Pittsburgh**
  - William M. Orr Co., Inc. (AB)
- **York**
  - Edgcomb Steel Co. (AB)
  - York Corrugating Co. (A)

RHODE ISLAND
- **Providence**
  - Congdon & Carpenter Co. (AB)

SOUTH CAROLINA
- **Greenville**
  - J. M. Tull Metal & Supply Co. (AB)

TENNESSEE
- **Memphis**
  - Metal Goods Corp. (AB)

TEXAS
- **Dallas**
  - Earle M. Jorgensen Co. (AB)
  - Metal Goods Corp. (AB)
  - Moncrief-Lenoir Mfg. Co. (AB)
- **Harlingen**
  - Moncrief-Lenoir Mfg. Co. (AB)
- **Houston**
  - Earle M. Jorgensen Co. (AB)
  - Metal Goods Corp. (AB)
  - Moncrief-Lenoir Mfg. Co. (AB)
- **Lubbock**
  - Moncrief-Lenoir Mfg. Co. (AB)
- **San Antonio**
  - Moncrief-Lenoir Mfg. Co. (AB)
- **Temple**
  - Moncrief-Lenoir Mfg. Co. (AB)

WASHINGTON
- **Seattle**
  - Ducommun Metals & Supply Co. (AB)
  - Electric Steel Foundry Co. (AB)
  - Earle M. Jorgensen Co. (AB)
- **Spokane**
  - Electric Steel Foundry Co. (AB)

WASHINGTON, D.C.
- York Corrugating Co. (A)

WISCONSIN
- **Milwaukee**
  - Central Steel & Wire Co. (AB)

DOMINION OF CANADA
- **Montreal, Quebec**
  - Firth-Brown Steels, Ltd. (AB)
- **Toronto, Ontario**
  - Firth-Brown Steels, Ltd. (AB)
- **Vancouver, B.C.**
  - Esco, Ltd. (AB)

New steels are born at Armco

ARMCO STEEL CORPORATION
1720 Curtis Street, Middletown, Ohio

Send a copy of your new booklet, **How Armco Stainless Steels Improve Pulp, Paper and Profit.**

NAME _____ TITLE _____

FIRM _____

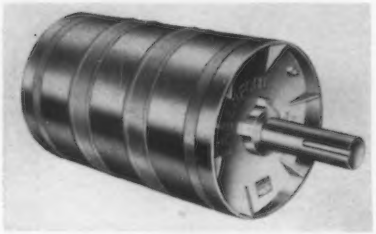
STREET _____

CITY _____ ZONE _____ STATE _____

ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation

(Continued from page 67)



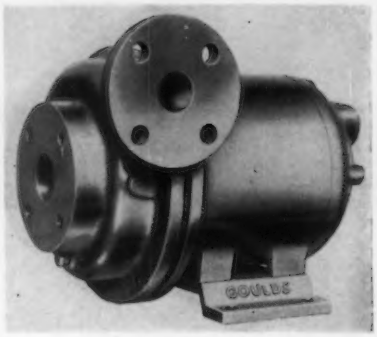
poles parallel to the shaft, this model maintains a magnetic field of strength close to the pulley and of equal force across its whole width. Standard available diameters are 8 inches, 12 inches, 15 inches and 18 inches.

The principle of permanent magnetic separation is the same for either model. Installed as the head pulley on a belt conveyor, the magnetic field acts through the belt to hold ferrous objects securely until they reach the underside of the pulley, where they are automatically released from the magnet's grip. Non-magnetic materials, on the other hand, follow the normal trajectory and are separately discharged well ahead of the iron. No rectifiers, wiring, etc., are required for any of these pulleys. Information and bulletins are available from Eriez Manufacturing Co., Erie 6, Pa.

Canned Pump Handles Hazardous Liquids

A seal-less (canned) centrifugal pump for the leak-proof handling of volatile, toxic, inflammable or other hazardous liquids is announced by Goulds Pumps, Inc. Pump is positively leak-proof as it has no mechanical seal, stuffing box or gland. These features are the result of combining the motor and pump in an integral unit.

Built in two sizes with 1 inch and 1¼ inch discharge, pumps have a capacity range up to 110 g.p.m., heads up to 100 ft. and are recommended for handling clear liquids only. Cooling of the motor and lubrication of all parts is accomplished by circulating a controlled portion of the liquid being handled through the hermetically-sealed rotor housing and the grooved bearings. All pumps are



equipped with a built-in thermal cut-out device that protects the motor in the event motor winding temperature exceeds the maximum safe limit. The motor is a two-pole, 3-phase, 60 cycle, 220-400 volt type, non-ventilated hermetically sealed with encapsulated windings. Goulds does not recommend these pumps for handling liquids containing abrasives or other solids but for clear liquids only. Pumps are regularly supplied in 316 (CF8M) stainless steel, but other materials can be furnished on applications. Complete data is available in Bulletin No. 728.1. Write Goulds Pumps, Inc., 203 Black Brook Rd., Seneca Falls, N. Y.

"Known by the Reliability of its Service as well as the Quality of its Product"

GREAT EASTERN GE

Quality
Service
Reliability

GREAT EASTERN

PACKING & PAPER STOCK CORP.

53-01 GRAND AVENUE, MASPETH 78, NEW YORK • EVERGREEN 6-2565
STATION & HALLECK STREETS, BOSTON 20, MASS. • GARRISON 7-5720
SALES OFFICE: 250 PARK AVENUE, NEW YORK 17, NEW YORK • YU-KON 6-7840

Prices of Fibers

MARKET WOOD PULP

SECOND QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$ 82.50/ 90.00	$82.50/ 90.00	§$90.00/ —	§$80.00/ —	§$90.00/ —
Bleached Gw'd	$ 97.50/100.00	$97.50/100.00			
Kraft, Blchd.	‡152.00/160.00				§157.50/ —
Kraft, Blchd. Hdwd.	152.00/ —		140.00/ —		
Kraft, Semi-bleached.	140.00/145.00				
Kraft, Unbl.	117.50/125.00	125.00/130.00	†125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡150.00/155.00	‡150.00/155.00	*155.00/ —	*155.00/ —	155.00/ —
Sulphite, Bl. Hdwd.	150.00/ —				
Sulphite, Unblchd.	135.00/ —	135.00/ —	†135.00/ —	*135.00/ —	
Sulphite, Unb'l. Gl'sn		140.00/ —	†134.00/ —		
Soda, Blchd.	147.00/150.00	150.00/ —			

§ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances.
‡ Depending on Brightness.

COTTON LINTERS

F.O.B. OIL MILLS
WEEK ENDED MARCH 29

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	n.a.	n.a.	n.a.	n.a.
2	n.a.	n.a.	n.a.	n.a.
3	$7.50/7.00	$8.50/7.75	$7.50/7.00	n.a.
4	7.00/6.25	7.25/6.25	6.50/6.25	8.50/ —
5	6.25/5.75	6.00/5.50	6.00/5.50	8.00/7.00
6	5.75/4.75	5.25/5.00	5.25/5.00	6.50/4.50
7	4.75/4.25	4.50/4.00	4.75/4.00	4.25/4.00

WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	Apr. 4	Apr. 4	April	April
No. 1 Mixed Paper	$ 7.00/ 9.00	9.00/ 11.00	8.00/ —	12.00/ 13.00
No. 1 News	14.00/ 15.00	14.00/ 15.00	16.00/ —	12.00/ 13.00
Overissue News (Lg. size)	13.00/ 15.00	13.00/ 15.00	21.00/ —	19.00/ 20.00
Mill Wrappers	19.00/ 22.00	13.00/ 15.00	11.00/ —	14.00/ 15.00
Old Corrugated Containers	22.00/ 23.00	21.50/ 22.00	20.00/ —	23.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	30.00/ —	65.00/ —
New Double Kr. Ld. Corr. Cuts	32.50/ 35.00	35.00/ —	32.50/ —	35.00/ —
(Semi-chem. medium)	45.00/ —	45.00/ —	42.50/ —	— / —
New 100% Kraft Corr. Cuts	40.00/ 42.50	— / —	57.50/ —	— / —
New Br. Kraft, Env. Cuts	70.00/ 75.00	70.00/ 75.00	52.50/ —	55.00/ —
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	52.50/ —	55.00/ —
New Br. Kr. Bag Waste Unprintd.	60.00/ 65.00	65.00/ 75.00	60.00/ —	60.00/ —
No. 1 Groundwood Shvs.	25.00/ 30.00	25.00/ 30.00	20.00/ —	32.50/ 35.00
White Newsblanks	50.00/ 55.00	50.00/ 55.00	35.00/ —	60.00/ —
No. 1 Soft White Shvs.	60.00/ 65.00	57.50/ 60.00	60.00/ —	70.00/ 75.00
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	70.00/ —	— / —
Hd. White Shvs.	85.00/ 90.00	90.00/100.00	85.00/ —	95.00/ —
Hd. White nv. Cuts	100.00/105.00	105.00/110.00	90.00/ —	113.00/ —
Col. Tab. Cards	42.50/ 45.00	42.50/ 45.00	47.50/ —	40.00/ 45.00
Manila Tab. Cards	62.50/ 65.00	62.50/ 65.00	65.00/ —	70.00/ 75.00
No. 1 Col. Ledger	37.50/ 42.50	37.50/ 42.50	42.50/ —	29.50/ 32.50
White Ledger	50.00/ 55.00	52.50/ 57.50	52.50/ —	55.00/ —
Mixed Book & Mag.†	22.00/ 25.00	— / —	14.00/ —	— / —
No. 1 Books‡	19.00/ 21.50	17.00/ 19.00	30.00/ —	16.50/ 18.50

† Includes Time & Life; no coarse groundwood. § Not to exceed 10% of groundwood.

THIS FREE BOOK

shows you how to cut light soda ash storage space by 60%

This booklet is loaded with facts, photos and diagrams showing three alternate unloading systems now used by many plants.

These systems are coupled to a storage system based on the principle of increasing bulk density of light soda ash to save storage space.

By storing light soda ash as slurry, you can often save as much as 60% of the storage space required for dry storage. Diamond's Sales and Technical Service team is anxious to assist you in your consideration of this cost-lowering method of handling soda ash in your plant. Write for this booklet today.

Diamond Chemicals

Diamond Alkali Company
Union Commerce Building
Cleveland 14, Ohio

Please send free booklet, "Soda Ash Slurry Storage Systems."

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Title_____
Company_____
Address_____
City_____ State_____

Also send information on

☐ Chlorine ☐ Silicate of Soda
☐ Caustic Soda ☐ Salt Cake

NEWS OF SUPPLIERS

G. E. Reid

L. Hesketh

Koehring-Waterous Ltd., Brantford, Ont., has announced the appointment of two senior project engineers to its Pulp and Paper Division sales force.

George E. Reid, graduate of the University of Toronto, has a ten year background of extensive experience in mill operations. Formerly with Anglo-Newfoundland Development Co., Abitibi and C.I.P., his principal task in his new appointment will be to spearhead the applications of the Koehring-Waterous Co.'s new Gravidecker, and to develop further applications of the corrugated cylinder principle to high speed cylinder board operations and other papermaking uses.

Leslie Hesketh, a comparative newcomer to Canada, brings with him a wide range of experience in the production of Viscose, cellulose films, and was employed by the Transparent Paper Co.,in Bury, England.

Douglas Hartley, assistant manager of the Pulp & Paper Division, will continue to handle and service the Waterous Grinders.

Smith & Winchester Manufacturing Co., South Windham, Conn., announce the addition of five project engineers to its engineering department to meet the increasing demand for its products.

Waldyn Benbenek is assigned to the electronic department working on "Spacemastre" Electronic Automatic Spacer for automation of Trimmers.

Gene Rood and Mart Martinson are specializing on Smith & Winchester Precision Rotary Sheeters.

Conrad Rothman and W. Matthews are specializing on "Trimmastre" Undercut Trimmers.

Lockport Felt. Co., with a plant in Newfane, N. Y., will buy about 100 acres in nearby Burt for an additional plant, Raymond J. Lee, company president, disclosed.

In 1955 a plant was opened in Starkville, Miss., and about 300 persons worked there. The company manufactures woolen felt, a type of cushion for conveying paper.

Allis-Chalmers Manufacturing Co. has announced the appointment of Charles F. O'Riordan as manager of the North Central region, Industries Group. He succeeds M. M. York, who has been assigned to a new position in Milwaukee.

Robert E. Morris has been appointed manager of the group's Midwest region. He succeeds Mr. O'Riordan.

J. A. Sudduth becomes manager of the St. Louis district as successor to Mr. Morris. William S. Wright becomes manager of the Grand Rapids (Mich.) district. He succeeds Mr. Sudduth.

Bauer Bros. Co., Springfield, Ohio, announces the appointment of E. L. Rastatter as general sales manager. In this newly created position, Mr. Rastatter will be responsible for all machinery sales in the pulp and paper, food, oil seed, asbestos and chemical industries.

E. L. Rastatter

M. D. Woodruff

Before joining The Bauer Bros. Co. in 1952 as technical director, Mr. Rastatter had engaged in original research work on cleaners while with the Hammermill Paper Co., Erie, Pa. Because of this background, a major part of his time at Bauer had been devoted to the further development and sales of Centri-Cleaners.

Announced at the same time was

"Do you realize we're in a multi-billion dollar industry."

the appointment of M. D. Woodruff as manager, Cleaner Division. Mr. Woodruff has been associated with the Bauer Bros. Co. since 1928, serving in several engineering and sales capacities. As chief engineer, he played an important part in the company's development of the Centri-Cleaner for the pulp and paper industry.

B. L. Hammill

W. D. Markowski

H. R. Patterson

R. H. Elkins

Beloit Eastern Corp., Downingtown, Pa., announces that complete sales and engineering services are now offered by this organization.

A member of the Beloit group, Beloit Eastern will concentrate its major activity on finished product processing equipment winders, supercalenders, roll wrappers, roll lowering tables, roll and shaft handling equipment, slitters, conveyors, unwind stands and tru-tension control, and other products for the paper and allied industries.

Beloit Eastern appointments are announced as follows:

B. L. Hammill has been appointed sales manager. Mr. Hammill has been associated with Beloit Iron Works for 23 years as engineer, sales engineer, and manager of special products.

W. D. Markowski has been named manager of winder sales. Mr. Markowski has been associated with Beloit Iron Works for five years as a staff engineer and sales engineer. He, too, has had wide experience in the paper industry. His major interest has been concentrated on the winder.

H. R. Patterson has been named chief engineer. As a Beloit staff engineer, he has been responsible for some of the major developments in Beloit's finished product processing equipment over the past ten years.

United States Rubber Co. has named Thomas B. Applewhite manager of conveyors products sales, effective immediately. Mr. Applewhite, who had been assistant manager of the conveyor products department the past year, succeeds Robert E. Spoerl who has resigned.

Mr. Applewhite has been with U. S. Rubber's mechanical goods division since his graduation from Memphis State University in 1947. During that time, he was assigned to the St. Louis and Pittsburgh branches of the division. He specialized in conveyor installations for underground and strip coal mines, fluorspar mining, and the limestone industry. His offices are located at the Passaic, N. J., plant of the rubber company, manufacturing and sales center for conveyor products.

Nalco Chemical Co., Chicago, Ill., announces that Robert H. Elkins has joined the company as manager of corporate research.

In his new position, Dr. Elkins will be responsible for corporate research projects, and will assist in projects aimed at developing new products and processes.

Prior to becoming associated with Nalco, Dr. Elkins was associate director of Borg-Warner Research center, where earlier he had been manager of organic and polymer chemistry. He previously had been a research chemist for Standard Oil Co. of Ohio, Great Lakes Carbon Co. and Sinclair Research Laboratories.

Midland-Ross Corp., announces the retirement of William A. McKinley, board chairman of the corporation, and Saxton W. Fletcher, vice chairman.

Mr. McKinley is a veteran of 40 years service with Midland-Ross and its predecessor firms. He served as president and a director of the former Midland Steel Products Co. before that firm merged with the J. O. Ross Engineering Corp. to form Midland-Ross.

Mr. Fletcher was president of Ross Engineering at the time of the merger with Midland Steel and served as a vice president of Midland-Ross Corp. until 1958 when he became vice chairman of the board. He joined Ross Engineering in 1923 as a specialist in air systems for the paper industry and held several

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positions, including secretary and vice president prior to his election as president in 1944.

Black-Clawson Co., New York, has appointed Jack A. Perry technical sales service engineer with the Dilts Division. Mr. Perry makes his headquarters at the Dilts plant in Fulton, N. Y., and will specialize in sales and service of Dilts on- and off-machine coating equipment for paper mills and converting plants.

In his last position with the Weyerhaeuser Co., Longview, Wash., Mr. Perry conducted development work in size press and coating formulations and was supervisory project chemist for start-up of coater and multi-laminator installations. He was previously employed by Crown Zellerbach Corp., Monsanto Chemical Co., and Huyck Felt Co.

J. A. Perry

C. L. Kircher

Bulkeley, Dunton & Co., has elected Charles L. Kircher vice president. He joined the paper firm in 1947.

J. O. Bulkeley, president, said that Mr. Kircher, as active head of the business, will work to expand the company's Converter and Publication department.

H. W. Stiles, vice president since 1952, will continue as consultant.

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Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures
(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Feb. 27	Mar. 5	Mar. 12	Mar. 19	Mar. 26
1960	97.1	97.3	97.4r	98.1r	99.9
	Feb. 28	Mar. 7	Mar. 14	Mar. 21	Mar. 28
1959	93.0	91.8	93.9	94.1	92.9

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.7	97.9‡	—	—	—	—	—	—	—	—	—	—	—
1959	87.8	90.5	93.2	94.4	95.5	95.6	84.5	96.0	92.4	97.4	96.2	86.6	94.0

‡ Preliminary

COMPARATIVE YEARLY SUMMARIES

	1953	1954	1955	1956	1957	1958	1959	1960
Year to Date	94.6	94.1	96.1	101.1	96.0	88.5	90.3	97.5
Year Average	92.3	91.6	96.2	97.9	90.4	87.0	94.0	—

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Feb. 27	Mar. 5	Mar. 12	Mar. 19	Mar. 26
1960	91	94	94	94	93
	Feb. 28	Mar. 7	Mar. 14	Mar. 21	Mar. 28
1960	91	94	94	94	95

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	—	—	—	—	—	—	—	—	—	—	—
1959	89	94	95	94	96	96	83	97	92	97	94	80	92

† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING Mar. 26, 1960	LAST WEEK ENDING Mar. 19, 1960	CUMULATIVE TO DATE Jan. 1 to Mar. 26, 1960, incl.
% Activity	93%	94%	93%
Total	316,264	320,721	3,798,932
Containerboard—Domestic Use	155,557	167,544	1,955,053
Liner	100,206	114,295	1,305,792
Corrugating Material	50,192	48,867	587,966
Chip & Filler Board	5,159	4,382	61,295
Boxboard—Domestic Use	102,523	97,337	1,187,231
Folding	61,687	56,904	707,421
Set-Up	9,962	11,742	134,616
Special Food Board	30,874	28,691	345,194
Other Paperboard	58,184	55,840	656,648
Containerboard Type	27,433	16,880	311,367
Boxboard Type	30,751	38,960	345,281
Total Orders			
Received	300,817	302,307	
Unfilled End of Week	419,526	441,526	

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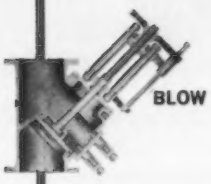

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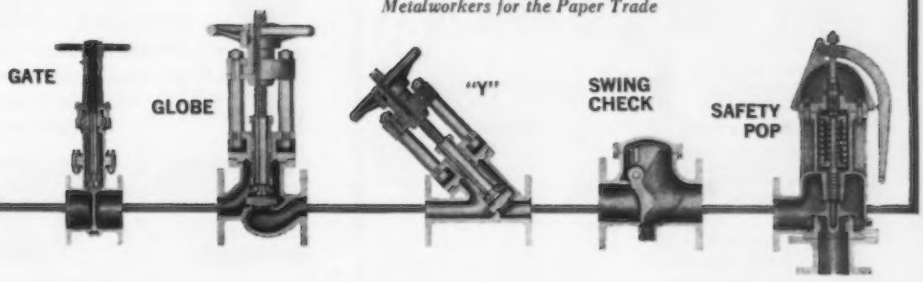

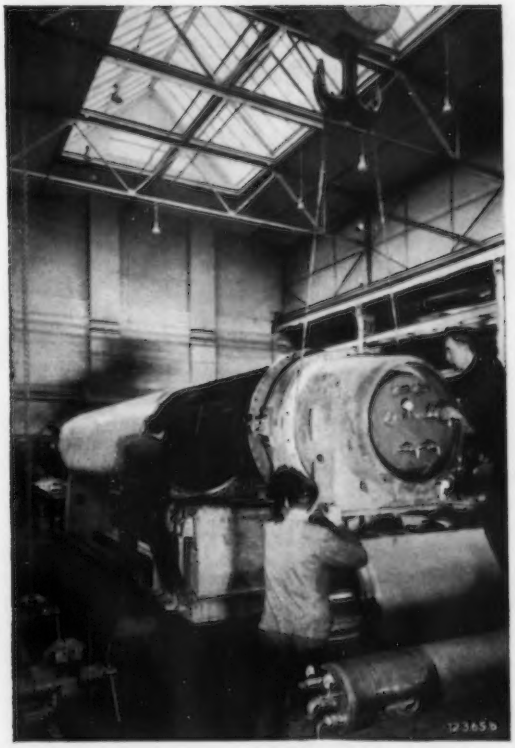

103 SUCTION ROLLS ON ORDER

bring factory serial numbers beyond the figure 1000. Today's paper machines require good suction rolls, for example VOITH suction rolls. Their installation is also economical for conversion jobs, particularly for suction presses. Increased production figures prove this fact. Wet parts with pick-up equipment comprise all modes of suction roll application: suction couch, pick-up suction roll, suction press, suction felt guide roll, suction felt washpress.

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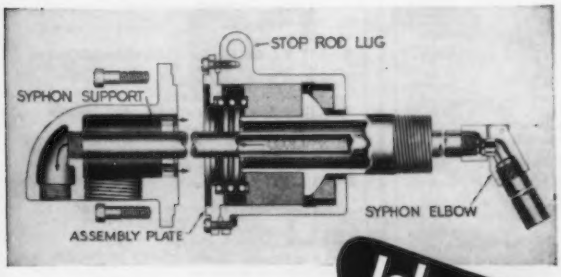

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1—31½" 4 color Heinrich Flexo Press
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OTHER SLITTERS

1—40" Fales Model B

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1—48" x 96" face.
2—48" x 108" face, with bearings & gears, 125 lb. pressure.
6—48" diameter x 130" face.

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1—43" 3-Roll Embossing Calender.
1—51½" 3-roll Smoothing Calender.
1—57" 3-roll Embossing Calender.
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2—12 Plate "Packer" Stainless Steel Vats

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1—Jones Standard, new spare tackle, with 75 h.p. motor.
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1—12" x 12" Valley Sheet dryer.
1—18" x 20" Williams Sheet Dryer
1—5 lb. Valley Beater.
1—15 lb. E. D. Jones Beater.
1—8" x 8" Valley Hydraulic Press.
1—Greene Freeness Tester.
1—Cady Micrometer.
1—High speed Jordan, anti-friction bearings.
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1—#1 Jones Pulp Master.

PUMPS
1—Economy Fan Pump 6000 g.p.m., 20' head, 50 h.p. motor.

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1—84" 3 bowl revolving reel.
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1—123"—3 bowl Revolving Reel.
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1—double disc Bauer Refiner, with 2-150 h.p. motors.
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Slimes in Paper and Paperboard Manufacture

PLAYING TWENTY QUESTIONS with the problem of whether slime is animal, vegetable or mineral points up to the fact that in paper mill practice, the word "slime" is no longer restricted to microbiological growths.

To mill men, slimes are any of the slimy deposits which may appear, ranging in content from hydrated fines and true microbiological slimes through hydrated aluminum oxide gels and entrained pitch, iron, silica and calcareous substances.

Identification Critical

Obviously, any appearance of slime in a mill system calls for *positive identification* of its substance, and *action* to bring it under control.

In appearance, it is usually difficult to detect any real difference between slime caused by bacteriological growth and that produced by masses of wet, hydrated stock and inorganic gels. Laboratory analysis is necessary to provide the detailed information required for an expert to recommend the type of control program to be followed.

Variety of Analyses Needed

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Prevention vs. Remedy

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Microbiological section of the Nalco Laboratories.

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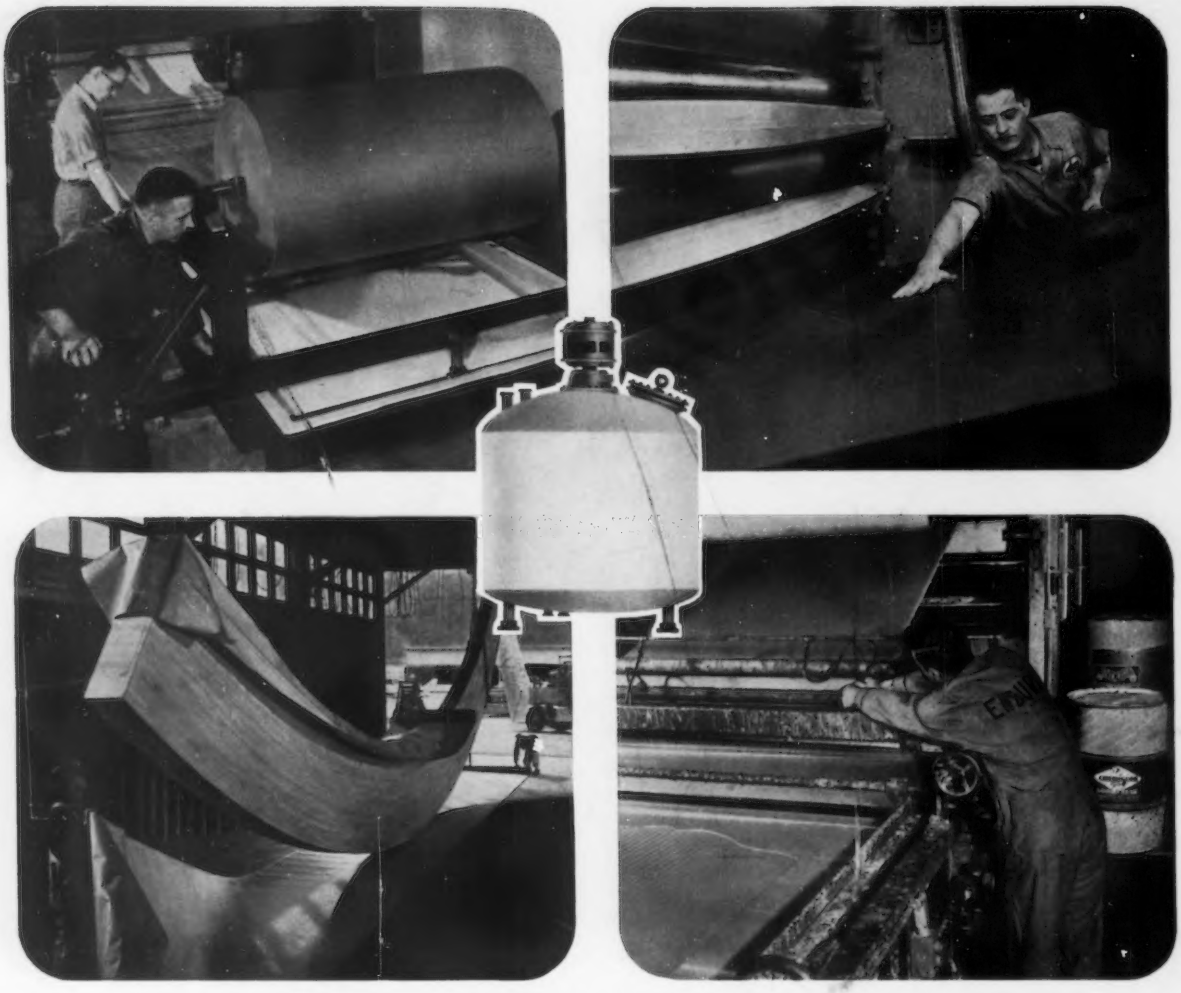

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